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ITS VARIETIES AND COMPLICATIONS,

&c. &c.

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By FRANCIS H. RAMADGE, M.D.,
FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS, ETC.

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A NEW TRANSLATION OF
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AND
ON DISEASES OF THE LUNGS AND HEART;

With copious Notes from Meriadec Laennec, Andral, Ramadge, &c.

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ASTHMA,

ITS VARIETIES AND COMPLICATIONS:

OR, RESEARCHES INTO THE

PATHOLOGY OF DISORDERED RESPIRATION;

WITH

REMARKS ON THE TREATMENT APPLICABLE TO EACH VARIETY:

ILLUSTRATED BY CASES, AND PLATES

COLOURED FROM NATURE.

ALSO,

A SUCCINCT TREATISE

ON THE PRINCIPAL

DISEASES OF THE HEART.

"Que nous serions heureux, si nous pouvions échanger ce que nous avons appris en médecine jusqu'aujourd'hui, contre ce qui nous est encore inconnu!"

BY

FRANCIS HOPKINS RAMADGE, M.D.,

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS,
LATE SENIOR PHYSICIAN TO THE INFIRMARY FOR ASTHMA, CONSUMPTION, AND OTHER DISEASES OF THE CHEST, AND
FORMERLY LECTURER ON THE PRINCIPLES AND PRACTICE OF MEDICINE, ETC.

Second Edition.

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PREFACE

TO THE SECOND EDITION.

Notwithstanding the vast improvements which have been made in modern times in every department of medical science, it must be admitted that the doctrine of Nervous and Spasmodic Disease still remains in considerable obscurity. A more striking instance of the truth of this assertion cannot be adduced, than the disease called by the name of *Asthma*. Some of this obscurity may be referrible, in the case now before us, to the employment of the abstract term which is made use of to express groups of symptoms widely differing in their seat and nature. From the great advances now being made in investigating the relations and multiple associations effected in the human body through the medium of the nervous system, there is good reason to hope that much of the darkness, which is at present spread over many parts of the domain of Pathology, will be removed, and that we shall be enabled to employ the term Asthma and other similar abstract terms with the same definiteness of meaning, the same precision of idea, as we now use the terms Pneumonia, Pleuritis, &c.

In preparing the present Edition, I have allowed no opportunity to escape of improving it, as well by the fruits of my own extended experience since the appearance of the preceding Edition, as by the great mass of information contributed by the medical writers of the Continent. If it cannot be said that we have advanced much in our knowledge of the pathology of Essential Asthma by any recent discoveries, it will not be denied but that considerable improvement has been made in the method of treatment by the practice of Inhalation, which I now for the first time introduce into this work, as affording important advantages in relieving, and ultimately removing, that morbid state of the pulmonary apparatus on which the distressing symptoms of the affection mainly depend. The modus operandi by which these beneficial changes are effected by the use of the tube I have also endeavoured to explain, and I trust satisfactorily. It is, however, in that part of the book relating to *Diseases of the Heart* that the greatest improvement will be found: this part has been, in fact, entirely re-written, and very extensive additions made to it. It contains, indeed, as much on this important and formidable class of diseases as will suffice for all practical purposes.

The articles on *Hysteric Asthma, Hay Asthma*, *Thymic Asthma*, &c., have been considerably enlarged from various sources. The diagnosis between True and Cardiac Asthma, and the method of distinguishing it from other affections to which it bears many points of resemblance, and with which therefore it is most liable to be confounded, has received particular attention. The advantages of a correct diagnosis, important as they are in every class of diseases, have a paramount value in Asthma, it being our chief guide in directing the treatment most applicable to its various protean forms and perplexing complications. The reader will find the beneficial effects of Asthma supervening on Consumption, and tending to arrest its further progress, pointed out here in several striking instances. Such a complication as that of Convulsive Asthma with Hæmoptysis and other signs of phthisical disease, though frequently observed, and sometimes mentioned by old medical writers, obtained from them no particular notice. The peculiar relations in which these two affections stand with respect to each other, their incompatibility of coexistence for any length of time, were matters wholly unknown to them.

The hereditary transmissibility of Asthma has been considered in detail proportioned to the importance of the subject.

In reference to the prognosis in Asthma, the effect of the pulmonary obstructions which it induces on the Liver and other important viscera have received their due meed of attention. This is a point too often overlooked, and yet one which must considerably influence the progress and termination of the original affection. It is to the *treatment* of the disease, however, that the Author would chiefly call the attention of the practitioner. In this department he will find directions given, applicable not merely to the general management of the asthmatic patient, but such, also, as may be called for to meet the varying complexions of this distressing malady, as well as the peculiar constitution of the patient. The injudicious employment of purgatives and stimulants has been pointed out. The errors of preceding writers, who were, no doubt, destitute of the valuable light thrown on the subject of thoracic disease in general by the advances made of late years in medical science, have been noticed when it appeared necessary.

The opportunities which I have enjoyed for cultivating the Pathology of Asthma and of diseases of the Heart, will be readily admitted, when it is remembered that I have been connected for more than a quarter of a century with the Infirmary for Asthma, Consumption, and other diseases of the Lungs. For so long a period no Physician has had presented to him so extended a field for investigating all the varieties of THORACIC DISEASE.

The extent of my professional engagements has delayed for some years the publication of the present Edition. From the size of the volume having imperceptibly increased beyond what I had originally intended, the insertion of a greater number of cases, though prepared for the press, would swell the book beyond the legitimate dimensions.

24, ELY PLACE, LONDON,
Aug. 16, 1847.

PREFACE

TO THE FIRST EDITION.

In my Treatise on Consumption, I have laid before the Profession the results of my experience in the most destructive of the numerous Diseases incidental to the Chest. The reception it has met with has encouraged me to undertake the present work on a malady less fatal, it is true, but, when of an aggravated character, as exquisitely painful to the sufferer as it is alarming to the beholder.

Little has yet been done to put either the pathology or the therapeutics of Asthma on a satisfactory basis. The few works of our English medical writers on the subject propose little beyond theory in the one, and palliation in the other. Nor have the labours of the continental physicians been much more successful. The views put forward, in this country at least, have been chiefly traced from the limited opportunities of private practice; for the most extensive are circumscribed when compared with those afforded by a public institution.

Having enjoyed, for many years, the advantage of being Physician to an Infirmary expressly devoted to Diseases of the Chest, I have been enabled to observe them on a large scale; and, whatever may be the fate of my conclusions, I have not been negligent in the collection of facts.

My aim, throughout the work, is practical. I have never theorised, except where induction from copious particulars, has warranted me in reasoning from effects up to causes. But I have been diffuse upon the treatment of the disease, in all its varying phases; and so conversant has my position made me with the clinic of Asthma, that I believe the modes of cure and of mitigation now developed will be found—where novel, efficient; and where old, improved.

Books, it will be seen, I have not neglected; but my only guide has been—NATURE.

LONDON, *March* 28*th*, 1835.

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HISTORICAL ACCOUNT

OF

ASTHMA.

NOTWITHSTANDING the great advances which have been made by the moderns on the ancients, in the various branches of Medical Science, and more especially in that department which treats of the classification of diseases, the term ASTHMA is still used with nearly the same indefiniteness by the former, as it had been by the latter. Whether we are to refer this laxity in the use of the term *asthma*, to its Greek etymon ἀσθμαίνειν, *to breathe with difficulty*, or whether we should not rather infer from such a name the vague, and indistinct ideas, which were entertained of the nature of the disease, it is scarcely worth our while to discuss. The same want of precision, however, may with equal justice be charged on many other terms to be found in our descriptions of disease; and when we consider the matter dispassionately, we shall find that such vagueness is unavoidable, when we are driven to the necessity, as in the instance now before us, of denominating a malady, not from its seat, of which we may be ignorant, but from some prominent and constantly observable symptom. There is no fear, that any two well educated physicians of the present day—men, I mean, accustomed to the close observation of disease in the living body, and to the diligent investigation of its effects by examination after death, will attach different ideas to the term *asthma*. Such persons well know that while dyspnœa is a symptom of asthma, yet that *dyspnœa* and *asthma* are not convertible or synonymous terms; that is, that dyspnœa is not necessarily asthma. We, of course, readily admit that formerly, when ideas were less the objects of men's attention than words, considerable confusion must have frequently occurred both in the theory and practice of medicine. That which was cause according to one pathologist, was but the effect according to another; the same confusion must have happened with respect to remedies.

From the earliest periods of medical science, attempts have been made to distinguish asthma as a separate disease, and to mark the boundaries which divide it from disorders nearly related to it. The moderns, generally speaking, recognize two primary species — the spasmodic and the humoral asthma. Countless sub-divisions of these are again made; and accuracy is converted into uncertainty by excessive minuteness. Far am I from asserting that the classification of this multiform disease, here adopted by me, is at all preferable, in a strictly scientific sense, to that of any preceding writer. I believe it will be found more convenient, in a practical point of view, inasmuch as the division is a limited one, and yet more varieties may be properly referred to each head than any other arrangement will permit, with which I am acquainted. My chief aim will be to point out the peculiar phenomena characteristic of each variety of the disease, and then by ascertaining the different stages through which these pass, to establish a method of prevention, and of cure, more satisfactory than any I have hitherto met with.

It is not a little remarkable that although the ancients, Hippocrates included, appear to have had no distinct knowledge of the true nature of asthma, and to have regarded it as a symptom occurring in different diseases, rather than as an aggregate of symptoms constituting a peculiar malady, no better account has been given of it than that furnished by one of our oldest medical writers, Aretæus. I shall here introduce his truly graphic description:—

"If from running, and exercise, and labour of any kind, a difficulty of breathing follows, it is termed *asthma;* and the disease *orthopnœa* itself is likewise called *asthma*, since in the paroxysms those troubled with the latter affection have embarrassed respiration. It received the appellation of *orthopnœa* from the patients' breathing easily in the erect posture only, and being liable to suffocation if they lie down. * * * The lungs are attacked, and the parts which contribute to respiration, as the diaphragm and thorax, sympathize. But if the heart be affected the patient cannot long survive, since here begin respiration and life * * * *. The precursory symptoms of this disease are, weight at the chest, an unwillingness to attend to one's ordinary avocation, or to business altogether, uneasiness of respiration in running, or going up hill. The patients are affected with hoarseness and coughing, flatulency in the præcordia, eructations without any assignable cause, watchfulness, and a slight undefined nocturnal heat; the nose is sharp and greedy of air. Under increasing disorder, the cheeks flush, the eyes are prominent as in cases of strangulation, a snoring is heard while they are awake; and the evil is much augmented during sleep. The voice indicates the presence of mucus, is feeble and indistinct. There is a desire for much cold air. They seek the open air, nor does any house seem sufficient for the purposes of respiration. They breathe in an erect posture, as if anxious to draw in all the air possible, and open their mouths so as to take in a larger quantity. The face is pale, except a flush over the cheek bones; sweat bedews the forehead and neck; the cough is constant and violent; the expectoration is scanty, thin, cold, somewhat resembling the efflorescence of froth. In the inspiration the neck is swollen: the præcordia are revulsed: the pulse is small, frequent, and depressed: the legs are attenuated: and if there be an aggravation of the symptoms, the patient is strangled as in epilepsy. But when the disease takes a favourable turn, the cough is longer, though less frequent, with an excretion of humid matter in greater quantity. There is a watery rumbling in the bowels; a copious secretion of urine without any sediment; the voice is more powerful, the sleep satisfactory, with relaxation of the præcordia, during which a pain at times passes to the back; the breathing becomes rare, gentle, but there is asperity of voice. Thus it is they escape death; but in the remissions, although they walk about in an upright posture, they yet bear the signs of the disease."

Sauvage has employed the word *suspirium*, used likewise by Celsus and Seneca, as a general term, to designate asthma. Independently of this authority, it has a prescriptive claim to admission into the medical vocabulary, from being identified with the person of Virgil; and this, moreover, through the pleasant observation of Augustus, who, alluding to the asthma of the epic poet, and the weak eyes of Horace, was wont to say, when they were seated on either side of him at table, that he was "*inter suspiria et lachrymas*" (between sighs and tears).

It is, I may add, no mean proof of the close observation of the Roman Emperor, to have noticed the sighing sound (which is similar to that of wind through a crevice), oftentimes the accompaniment of asthma; and from which, as we have seen, one of our most eminent nosologists has taken his designation of the disease.

Modern writers are, generally speaking, no less faulty than the ancient, in neglecting to lay down with precision the nature and succession of the symptoms which constitute asthma a distinct affection. Sauvage has committed this error, by giving to asthma a sense almost as extensive as that which belongs to dyspnœa. Others classify the disease into numerous distinct forms, many of which are undoubted epiphenomena, or symptomatic affections. Stahl, unlike the majority of nosologists, has treated the subject in a definite and judicious manner. His description of the true form, under the title of

Dyspnœa Spastica, is precise and masterly. Van Helmont, by his denominating asthma *caducus pulmonum* (epilepsy of the lungs), seems to have entertained a correct view of its nervous origin; and later writers, guided by the light thrown upon the history of the diseases of the heart and pulmonary apparatus by the science of Corvisart, have reduced what yet remains to be known of this distressing malady within very narrow limits. But the one writer, to whom we are chiefly indebted for enlarging our pathological views, and, above all, giving accuracy to our diagnosis in pectoral ailments, is Laennec. His example and writings have given an impulse to the study of medical physiology, and a precision to our knowledge of the distinguishing characteristics of thoracic disease, the benefits of which will be felt by generations yet unborn; and whatever improvements in his own grand domain of Auscultation may yet be made, he must ever form the central figure in the group of discoverers—

> Medium nam plurima turba
> Hunc habet, atque humeris extantem suspicit altis.

The history of the disease has been minutely traced by two English medical writers in particular; and, unhappily for themselves, from experience in their own persons. These are Sir John Floyer, whose "Treatise of the Asthma" appeared in 1698; and Dr. Bree, who published the first edition of his "Practical Inquiry into Disordered Respiration" in 1800. Thirty years previously to Floyer's publication, the celebrated Thomas Willis, in his "Pathologiæ Cerebri, et Nervosi Generis Specimen," had given to the medical world the first diagnosis of this disease possessing any claim to accuracy. Since his time the nervous character of the affection has been generally recognized; and the question, which divides the most esteemed medical writers of recent date, is, whether asthma be essentially nervous, or dependent on some hitherto undiscovered lesions. Andral, Cruveilhier, Laennec, Recamier, and other distinguished observers, have never met with any organic lesion, however slight, which might be regarded as the cause of asthma. It is not improbable, in many instances, that through defective data, in the absence of some perceptible lesion in the lungs, or heart, or the large vessels, affections merely concomitant have been erroneously taken for causes. A proof of the primary influence of organic disease in producing asthma may be sought in the fact, that the asthma of old age generally proceeds from some morbid change in the large vessels, or in the valves of the heart, or some alteration of tissue palpably generated by the hand of time, and, of course, is not nervous. On the other hand, there have been frequently observed, without any sign of asthma, far advanced lesions of the organs of respiration and circulation. Indeed, examples are not wanting of asthma having preceded the development of structural diseases of the thorax, and ceasing as if by the ingression of the latter. Experimental physiology, employed with a view of determining the nature of asthma, has imitated in animals some of the peculiarities of the disease. Dupuytren, Legallois, Dupuis, and others, have, at will, effected every degree of stricture of the aerial passages by ligature, or by section of the eighth pair of nerves, so as to close the glottis, and produce paralysis of the lungs.

Those organic alterations, which may occasion symptomatic asthma, are most generally observable at the extremes of life; and we have many reasons to doubt the disease being really essential at either of these periods; for in old age irritability is deadened, and, although great in childhood, it leaves but few traces. Again, contractility is much more developed in middle age than at either of the extremes; and the influence of the passions is, of course, considerably greater. However, dyspnœa in childhood, arising from lesions of the heart or of the large vessels, is as rare, as it is common among the aged. An exception must be made for those cases which are congenital, or which are sometimes occasioned by enlargement of the thymus gland, tonsils, &c.

When death occurs from suffocation in intense and prolonged asthmatic fits, the same congestions are observed in the substance and membranes of the lungs, which are met with in asphyxia. A long list likewise of organic alterations has been given by various writers, which, however, in many instances, are perfectly irrelevant, either as causes or effects. Those, which are really important, may be briefly stated to be some species of structural impediment in the larynx, or trachea, diminishing the ordinary calibre of these parts; extensive adhesion, inflammation, or emphysema of the lungs; œdema of the same organs; glandular or calcareous obstructions at the root of the lungs; various organic lesions of the heart and aorta, as well as valvular irregularity of both; ossification of the coronary arteries; chronic pericarditis, &c. The different questions which have been propounded on this subject, and which naturally arise from it, need not be here entered into.

I shall now proceed to consider the subject of asthma in general, as it is ordinarily observed, having first placed before the reader the various characters given of the disease by the principal writers on the subject.

Willis defines it to be *one in which the breathing is difficult, frequent, and panting, with great agitation of the chest, and generally without fever.*

We certainly cannot subscribe to the adequacy of this definition.

Hoffmann defines asthma to be, *embarrassed and very laborious breathing, conjoined with inexpressible distress and constriction of the præcordia, interfering with the free passage of the blood through the lungs, arising from various causes, not devoid of danger of suffocation.*

Dr. Bree's definition is as follows :

Asthma *is an excessive contraction of the muscles of respiration, usually called difficulty of breathing, without acute fever, excited by some irritation in one of the viscera which these muscles serve.*

If we had reason for objecting to Willis, as violating one of the requisites of good definition, we certainly have stronger reason for censuring this as being wholly deficient in clearness ; besides, the assumed cause of a disease has no right whatever to enter into a definition of it.

I shall take the liberty of proposing the following definition, which I trust will be found to be based entirely on the phenomena, and to assume nothing with respect to the material cause of the disease:

Extreme difficulty of breathing, returning in paroxysms, attended with wheezing, hard cough, and a feeling of tightness in the chest—ending in expectoration which is generally mucous—no fever observable during the fit.

Predisposing Causes.—Every age is subject to the ingression of asthma; but it may be observed, that it is owing to different causes and assumes different characters, according as it affects children, adults, or aged persons. M. Rostan has clearly pointed out that the dyspnœa and other disturbances of the respiratory organs, so frequent in aged persons, are not so much instances of genuine asthma, as effects of organic diseases of the heart or its great vessels. With respect to *sex*, men are said to be more liable to it than women, but the proportion seems to have been much over-rated by J. Frank. The disease is stated to be much more frequent in temperate climates than in either very cold or very warm countries. *Hereditary transmission* seems to be another very influential predisposing cause of this disease. Most certainly, if it be not strictly hereditary, it is frequently attributable to certain congenital defects of organization, such as narrowness of the glottis, trachea, or bronchi, extreme sensibility of the opening of the glottis, and of the membrane lining the interior of the air-passages. Under this head may be classed also malformation of the chest itself, whereby its diameters become contracted. Temperament also exercises no inconsiderable influence in the production of asthma; it is well known that persons possessing what is called a nervous temperament, are frequently attacked with this disease; the other temperaments predisposing to asthma are the bilious and melancholic. The same remark may be made in reference to plethoric individuals, who have habitually a full hard pulse, and short neck, high shoulders, great obesity, and a large head. Excessive and long-continued exertion of the voice has also been set down as a predisposing cause of asthma.

Certain pathological states may become predisposing causes. It is a well-known fact, that almost all organic diseases may give rise to sympathetic or nervous phenomena, which vary with the organ that may happen to be affected. In this way asthma also, considered as a nervous disease, may become developed under the influence of various pathological states. Thus, diseases of the heart and of its large vessels,—ossifications of the cartilages and soldering of the ribs—inflammatory and catarrhal affections of the bronchial mucous membrane—tumours pressing on the trachea—dyspepsia, with all its varied retinue, as gout, &c.—may serve as strongly predisponent causes of the development of asthmatic disease. We must always hold in view, that it is the great sensibility of the bronchial membrane, and not the catarrhal affection, of which it may be the seat, that is the great predisposing cause of asthma.

To conclude the enumeration of the predisponent causes, we may state that the suppression of habitual morbid discharges, as of blood from hemorrhoids,—of pus from old ulcers,—the retrocession or premature cessation of a fit of the gout,—the striking in of an eruption,—have been set down by most writers as predisposing to the disease.

In no disease are the recognizable, or the presupposed causes more various. The hypotheses which have been started through a passion for systematizing, and referring asthma to one primary origin, known, or conjectural, would fill a volume. With some writers it is an essential malady, with others an alteration of the nervous fluid; with others again, an alteration of the vital principle. Laennec refers it to the want of a more abundant oxygenation of the blood than what is sufficient for a healthy person; and finally, another sect of medical writers will have it that it is immaterial.

Determining Causes.—Under this head are enumerated all those circumstances known to have immediately induced a paroxysm of asthma in those predisposed or not.

As determining causes, heat and cold may be equally regarded as influential. The asthmatic is peculiarly susceptible of every variation of atmosphere. Richerand remarks, in his Physiology, that the respiration of some asthmatics is rendered very painful by the electrical state of the atmosphere at the approach of summer: and Rostan has noticed the effects of the cold in winter on old people, (who are besides generally subject to some mechanical obstacle to the circulation,) by constringing the solids and suspending the cutaneous perspiration, so as to render the capillary net-work of the periphery of the body less easily permeable by the blood, which is thus accumulated in the interior vessels and in the lungs. So keen is the susceptibility of the asthmatic to atmospheric changes, that even when the weather appears settled, and no indication is given by the barometer of approaching alteration, I often predict a change, with certainty, to the gentlemen attending the practice of the Infirmary, from the symptoms exhibited by the patients. In such case, the invalids will manifest a sudden and decided alteration, either for better or for worse, two or three days before any corresponding change in the weather; but I have long remarked that whenever an immediate well-marked difference in the symptoms occurs, the state of the atmosphere will invariably experience a change in two or three days' time. This observation will be found valuable to the future inquirer into the pathology of the lungs; and it is only, I may observe, by enjoying the opportunity of investigating diseases on a large scale, that such minute particulars can be collected and verified. The only internal organ, immediately susceptible of atmospheric influences, and by which we can be properly said to be connected with the aerial medium, is the lungs. Consequently, the fact above cited is easily explained; and the more so, when we consider the extremely delicate organization of this viscus. Brought constantly in contact, as it were, with the air, its mercury, if I may be allowed the expression, ascends and falls with a sensibility unattainable by the feeble mechanism of man. The lungs constitute an hygeinometer of index more sure, than the finest instrument art has produced since the first rude model employed by Torricelli.

Besides the influence of cold in bringing on the asthmatic paroxysm, it may be induced also by too elevated a temperature of the body, as by tarrying in a heated apartment, as well as by the use of the hot bath. Overheating the body by any kind of exertion, may produce a fit of asthma. Eating and drinking to excess, may likewise contribute to its coming on, as well as the inhalations of air impregnated with noxious or other vapours, as those of lead, sulphur, arsenic, chlorine, &c. The influence of night is said to have some share in exciting it. The odour of hay, and of other substances, as of ipecacuanha, has been frequently found to induce the fit; a residence in damp dwellings has produced the same effect. To these exciting causes, may be added repelled cutaneous diseases; suddenly suppressed hemorrhoidal and menstrual discharges, misplaced gout, several diseases of the abdomen, &c.

The influences now enumerated are capable both of producing asthma, if the predisposition be present, and where asthma already existed, of calling forth the paroxysms. It was in reference to these causal relations, that asthma was frequently divided into certain subspecies, as *asthma metastaticum—A. arthriticum—A. hemorrhoidale—A. flatulentum, &c.*

Asthma, except when seriously complicated, is by no means of difficult recognition, and even when the complications make near approaches to the external phenomena of asthma, no very great degree of attention is required to enable the practitioner to discover the simulation. In asthma, properly so called, the attack is generally sudden, or preceded by well-known symptoms, such as flatulent uneasiness in the stomach and bowels, undefined oppression and constriction of the chest, a short cough, general irritability and impatience, headache, dejection and languor, and involuntary closing of the eyelids, thirst and dryness of the mouth, a dry and cold skin, and a copious flow of clear urine, sometimes preceding, and, in other instances, subsequent to the invasion of the fit. Its usual periodicity, the shortness of its duration, the intervals of varying length, in which the return to health is more or less perfect, constitute other distinguishing signs. As the spasmodic breathing ceases, the expiration becomes proportionately more free; a bronchial secretion usually terminates the fit in a somewhat critical manner, and no symptom of organic lesion of the chest is perceptible in the interval. In symptomatic asthma, accompanied by some affection of the heart, or of the aorta, the palpitations in the region of the heart, the irregularities of the pulse, and alterations of the countenance form very distinctive characters. But by the aid of auscultation and percussion, a sure judgment may be promptly formed. The peculiar signs afforded by these media, in each asthmatic variety, will be pointed out when I come to treat of them in detail.

Since there are several diseases which bear a resemblance to asthma, whether pure or complicated, sufficient in many instances to raise doubts in the mind of the young practitioner, it may not be unadvisable to enter more minutely into the specific differences of these than has hitherto been done in treatises on this complaint. An advantage which may probably result from comparing asthma with those affections which are in any degree allied to it is, that by such comparison, they may be brought each to reflect light on the other. Of all apparently similar complaints, that termed by Darwin *Asthma Dolorificum*, but from Heberden's time, usually called *Angina Pectoris*, is the most liable to be confounded with pure asthma. By way of simplification I shall first mention those symptoms which belong alike to each of these two diseases, and then enumerate those which, occurring in the one, seldom accompany the other. One of the most prominent symptoms in this disorder is difficulty of breathing, or rather shortness of breath ; dyspnœa therefore may be said to constitute a point of resemblance between it and asthma. When the fit approaches its height, pallor of the countenance and excessive nervousness are concomitants of both disorders. A sense of suffocation is also observable in each. The exciting causes are, in many respects, similar; since many agents, which are influential in affecting the nerves, are calculated to interfere with the natural action of the heart. Thus trouble of mind, unusual exertion, and gusts of passion, will frequently induce a paroxysm both in angina and essential asthma. The coming on of attacks at night, after the patient has awakened from his first sleep, forms, at times, another point of resemblance. In numerous instances the angina recurs periodically, affording the patient a respite by a return of comparative ease, as is the case with periodic asthma. Thus far, there would seem to be a striking similarity between the two diseases. But, on a closer examination, the distinctive marks become very sensible. The pain felt in the chest, on an attack of angina, is restricted for the most part to the left side, and is often acutely felt under the mamma. The left arm, too, is generally affected with a darting pain, as if a red-hot iron were instantaneously plunged down it; and what is extraordinary, is, that in general it does not take the direction of any nerve, but shoots down the centre of the arm. This pain is, at times, superficial; at times deep-seated; and occasionally instead of this pungent pang a sense of numbness is experienced. To such an extent will this peculiar pain proceed, that I have known an individual, subject to the complaint, and to whom I was called in when he was suddenly seized with a paroxysm previous to death, expire, shrieking out, "My arm! oh, my arm!" The sensation of pain in the chest differs from that felt in asthma, inasmuch as it is of a sharper constrictory nature, not a sense of mere confinement or compression. I may here notice that dyspnœa is rarely coexistent with angina; and this now well-established fact was first satisfactorily verified by the celebrated John Hunter, who was a martyr to the disease. The fear of impending death forms another characteristic symptom peculiar to angina; and when the disease is of long standing, the mere motion of walking across a room is excitement sufficient to induce an attack. In many instances, the pulse will afford a well-marked distinction between the two diseases, since in angina pectoris it is often unusually low, falling to less than thirty pulsations in a minute. I would here observe, that the line of demarcation has not been accurately drawn between the various forms of this disease; many cases being now confounded with angina, which Laennec has more accurately denominated *Neuralgia*. In fact, these belong rather to a painful state of the nerves of the heart, than to actual structural disease. In order to illustrate the peculiar character of this affection, and by contra-distinction that of *asthma*, I shall introduce a case or two which have fallen under my own observation; but, first, I shall quote from Lord Clarendon's History of his own Life the most definitely marked case that has been handed down to us, and possessing an additional interest from the character of the writer, as well as the fidelity and graphic nature of the description.

I have retained the whole of the account, being unwilling, however unconnected parts of it may be with medical illustration, to mutilate so interesting a picture of the times by abridgment. The serenity with which the venerable man looked forward to "that undiscovered country, from whose bourn no traveller returns," although evidently entertaining a strong presentiment of approaching death, and the reverential simplicity with which each particular is detailed, form an harmonious whole, whose integrity I should deem it sacrilege to impair by any omission. "His father," he writes, "had long suffered under an indisposition (even before the time his son could remember), which occasioned him rather frequent pains than sickness, and gave him cause to be terrified with the expectation of the stone, without being exercised with the present sense of it; but from the time he was sixty years of age, it increased very much, and four or five years before his death, with circumstances scarce heard of before, and the causes whereof are not yet understood by any physician. He was very often, both in the day and the night, forced to make water, seldom in any quantity, because he could not retain it long enough; and in the close of that work, without any sharp pain in those parts, he was still and constantly seized on by so sharp a pain in the left arm, for half a quarter of an hour, or near so much, that the torment made him as pale (whereas he was otherwise of a very sanguine complexion) as if he were dead; and he used to say that he had passed the pangs of death, and he should die in one of those fits. As soon as it was over (which was quickly), he was the cheerfullest man living; eat well such things as he could fancy; walked, slept, digested, conversed with such a promptness and vivacity upon all arguments (for he was *omnifariam doctus*), as hath been seldom known in a man of his age; but he had the image of death so constantly before him in those continual torments, that, for many years before his death, he always parted with his son, as to see him no more; and at parting still showed him his will, discoursing very particularly and very cheerfully of all things he would have performed after his death. He had for some time before resolved to leave the country, and to spend the remainder of his time in Salisbury (where he had caused a house to be provided for him), both for the neighbourhood of the Cathedral church, where he could perform his devotions every day, and for the conversation of many of his family who lived there, and not far from it; and, especially, that he might be buried there, where many of his family and friends lay: and he obliged his son to accompany him thither before his return to London; and he came to Salisbury on the Friday before Michaelmas-day, in the year 1632, and lodged in his own house that night; the next day he was so wholly taken up in receiving visits from his many friends (being a person wonderfully reverenced in those parts), that he walked very little out of his house. The next morning, being Sunday, he rose very early, and went to two or three churches; and when he returned, which was by eight of the clock, he told his wife and son that he had been to look out a place to be buried in, but found none against which he had not made some exception, the Cathedral only excepted, where he had made choice of a place near a kinsman of his own name, and had showed it to the sexton, whom he had sent for to that purpose, and wished them to see him buried there: and this, with as much composedness of mind as if it had made no impression on him; then went to the Cathedral to sermon, and spent the whole day in as cheerful conversation with his friends (saving only the frequent interruptions his infirmity gave him once in two or three hours, sometimes more, sometimes less), as the man in the most confirmed health could do. Monday was Michaelmas-day, when in the morning he went to visit his brother, Sir Laurence Hyde, who was then making a journey in the service of the King; and from him went to the church to a sermon, where he found himself a little pressed as he used to be, and therefore thought fit to make what haste he could to his house; and was no sooner come thither into a lower room, than having made water, and the pain in his arm seizing upon him, he fell down dead, without the least motion of any limb. The suddenness of it made it apprehended to be an apoplexy; but there being nothing like convulsions, or the least distortion or alteration in the visage, it is not like to be from that cause, nor could the physicians make any reasonable guess from whence that mortal blow proceeded. He wanted about six weeks of attaining the age of seventy," &c. —The *Life of Edward Earl of Clarendon, &c.;* fol.; Oxford, 1759; pp. 9-10.

The above case is so clearly stated as to leave no doubt concerning the nature of the complaint. The "so sharp a pain in the left arm for half a quarter of an hour, or near so much," the "as pale as if he were dead," and "the image of death so constantly before him in those continual torments," together with the suddenness of his death, form so vivid and distinct a picture, that to have seen the patient could not have given us a clearer insight into his disease.

I give one out of several cases recorded in my notebook, which, however inferior in descriptive power, may serve to illustrate some points not touched upon in Lord Clarendon's account.

CASE PRESENTING WELL-MARKED ANGINA PECTORIS, PARTIALLY COMBINED WITH EPILEPSY.

I was consulted, on the 25th of May, 1824, by George Watson, by trade a currier, aged sixty-nine, resident in the east end of London. About nine years ago he was seized with a sense of giddiness, which terminated in a convulsive fit; of which, when he recovered, he had lost all consciousness. The immediate result of the fit was excessive debility; and similar attacks recurred at intervals, varying, at first, from two to three months; but for three years previously to this application their return had been as frequent as twice in a week, and on several occasions they succeeded each other within even a quarter of an hour. Their duration, he states, is uncertain; at times lasting only a minute, so far as he can judge from apparently momentary fits, from which he has recovered when by himself; at other times, they have continued almost uninterruptedly for two days and nights. At other times there will be a painful tremor of the heart, preceded, and on other occasions followed by, an agonizing, darting, vibrating pain, passing through the chest, and losing itself in the deltoid muscle of the left arm, which, at first but of momentary duration, afterwards increases so as to continue upwards of a quarter of an hour, and a sense of numbness then extends downwards to the extremities of the fingers. Sometimes the pain will take an upward direction to the throat, accompanied by suffocative constriction. At times he lies in a state of apparent deliquium, his bodily powers arrested even to the cessation of his pulse, and suspension of respiration; yet perfectly conscious, and with his mental faculties unobscured. Occasionally, temporary insensibility occurs. At such times the paroxysm is preceded by a sense of fulness and pain in the epigastrium; which last symptom extends laterally to the left mamma, and thence to the left arm as far as the elbow, and is increased by pressure. The respiration is impeded, but is at once relieved by the eructation of flatus. Before becoming insensible, he states that he undergoes a sensation of something ascending from the stomach to the head, or like the sudden passage of some fluid previously confined, through a narrow aperture. When it reaches the crown of the head it seems at once to burst through, and he drops down instantaneously. After a shock of this description has passed off, his general feeling is that of improvement rather than weakness. While the sensation above described continues, he feels, in conjunction with it, a sense of heat in the anterior regions of the chest, neck, and head. His pulse, at the time these minutes are being taken, is 24, accompanied by a vibratory motion, or as of a second and lesser pulsation following the stronger beat. The general number of beats, according to his own calculation, is from 24 to 27 in a minute; exertion, particularly ascending stairs, occasions a feeling of oppression at the præcordia, and renders the pulse slower. Occasionally on sitting down, after exertion, he has undergone so violent a palpitation near the region of the kidneys as to affect his whole frame with tremor. He is then obliged to walk about gently until it subsides. Respiration is natural. The extremities always cold, except when in bed; and once, during cold weather, he had symptoms of gangrene in the toes of the right foot. Two years before applying to me, he experienced an œdematous swelling of the legs and thighs, which continued for a fortnight, and proved an obstacle to walking. This state has not recurred. At every pulsation of the heart he suffers a momentary deprivation of sight; although, in other respects, his eye-sight is unimpaired, and he can read small print without glasses. His appetite is good, bowels regular, and, except involuntary startings which disturb him for some time after he first falls asleep, and unpleasant dreams, he rests well. His habits have been regular; but his employment, as currier, exposes him to wet and cold.

Five or six months after I first saw him, the disease terminated fatally; and the principal appearances discovered by autopsic examination, were as follows:—

The left ventricle of the heart in a state of hypertrophy, and moderately dilated. Ossific deposits were observable at the bases of the semi-lunar valves, which were themselves thickened, and on the aortic side of one of these valves was a calcareous concretion about the size of a pea. Beneath the lining membrane of the interventricular septum appertaining to the same ventricle, there was a semi-cartilaginous induration, extending about an inch and a half in the direction of the longer axis of the heart, and a little more than an inch transversely, about a line and a half in its thickest part, gradually diminishing to the outer edge of the plate. On dividing the aorta, the coats of this vessel appeared healthy, with the exception of a portion of the internal one about the size of a shilling, where was a calcareous deposit, like an earthy scale, part of which was bent out of the direction of the layer, projecting at right angles with it into the cavity of the vessel. This appearance was presented about an inch and a half above the orifices of the coronary arteries. These same arteries were unusually patulous, and these vessels for two inches along their course were converted into calcareous tubes, but of a diameter sufficiently capacious to admit of a comparatively free passage of the blood for the nutrition of the heart. The brain was carefully examined, but nothing unusual was observable, excepting that the internal carotid on each side of the sella turcica was singularly dilated. Neither was anything deserving of particular notice presented on examination of the abdominal viscera, as they deviated in very trivial points from their natural state.

I have been thus particular in marking the characteristics of angina pectoris, and illustrating them by the above cases, from the apparent similarity of the two complaints often leading to mistakes in practice.

To sum up my opinions on this disease, I am inclined to believe, from dissections of persons who have laboured under angina, and yet presented no appearance of ossification in the coronary arteries, and from my knowledge of cases in which morbid alteration of these vessels had existed without the manifestation of any symptoms of this complaint, that it is often entirely independent of any organic lesion whatever. In numerous instances, it appears to me to be a purely nervous affection. When the descending set of filaments derived from the cardiac plexus, which from taking the course of the coronary arteries are termed the coronary plexus, are affected, the chief manifestation of the disease is an irregularity in the action of the heart, accompanied by palpitation and pain; when through sympathy with the pulmonary plexus, or by direct junction, the cardiac nerves extend their irritability, the breathing becomes laborious and convulsed; and this obstruction is considerably increased, should the irritability be communicated to the intercostal nerves through the medium of the great sympathetic, which anastomoses, by various twigs, with both the cardiac and pulmonary plexuses. On the same principle the pain in the arm may be referred to an affection of the brachial plexus, either sympathetically, or by anastomosis. It is not improbable that the calcareous condition of the coronary arteries, to which I have before adverted, is in no small degree owing to a long-continued morbid state of their accompanying nerves. Blackall, in his work on Dropsy, has appended some useful cases, illustrative of the pathology of angina pectoris, to which he appears to have devoted some attention; and it is to be regretted, that he did not use the same degree of observation in investigating the former complaint. He appears to have made but few *post-mortem* examinations, and in those few to have been utterly unaware that disease of the heart was a most frequent cause of dropsy, there hardly being a remark made by him on its condition in those bodies he dissected.

To return to our more immediate subject, the symptoms with which the attack of asthma commences are a sense of general oppression, more particularly in the head and chest. The eyes are affected much in the same manner as in common cold; and there is a feeling of weight and fulness about the pit of the stomach. The patient is heavy and languid; disinclined to exertion, drowsy, and apt to fall into disturbed and uneasy slumber. In some cases, a day or two preceding the attack, the patient is sensible, a short time after dinner, of a feeling of weight and over-fulness in the region of the epigastrium, and the stomach is swollen and distended with wind. From the disturbance given to the digestive functions, the eructations are usually acid or insipid. Floyer observes, that the spasmodic state of the lungs is much more supportable in proportion as the gaseous distension of the intestinal canal extends itself downwards.

As the respiration becomes more difficult the pain at the chest increases, and the constriction is at last so intense as to be compared by the sufferer, to what might be supposed to arise from cords bound tightly around it. It heaves and dilates as if striving to burst these imaginary bonds, and is again compressed, as it were, by their violent re-action. The stupor and heaviness, at first felt in the head, are not unfrequently replaced, as the attack approaches its height, by severe head-ache. Slight fever is occasionally present, with its usual concomitants of thirst and restlessness: as are also dryness, corrugation and pallor of the skin. Cough, of a strictly convulsive nature, seldom at first accompanied by expectoration, comes on, and harasses the patient by its frequency and violence. It appears to the patient as if his lungs were pushed to the top of the thorax; a number of accessory muscles is exerted in aid of the ordinary muscles of inspiration, and sometimes with such efforts that convulsions, and even epileptic symptoms, have been observed to occur.

A deadly paleness now overspreads the countenance; the extremities turn cold, and the wheezing, which accompanies each expiration, is audible at the distance of several rooms. The sufferer literally gasps for breath; the vessels of the conjunctiva become swollen and turgid by the violence of the cough, and the eyes seem ready to start from their sockets. To speak at this stage of the paroxysm, is impossible, or if effected, the effort is agony. Even to make a sign with the hand is irksome: and to add to this complication of distress, the most even-tempered will at this crisis become fretful and peevish; and a gesture misinterpreted calls forth a manifestation of passion, and with it an aggravation of every harassing symptom. It not unfrequently happens that the mind participates in the highly-wrought excitement of the body, and adds a train of imaginary terrors to the real tortures which rack the patient's frame. A thousand ills, conjured up by the morbid state of the mental faculties, not only of themselves worry the patient, but by their reflected influence aggravate the poignancy of his suffering. Of course, it will be understood that all these symptoms are not always present, but the greater part of them constitute the ordinary characteristics of nervous asthma in its most intense form.

In the generality of instances, the first warning of its approach is given towards evening, and after retiring early to bed; from the stupor, which I have mentioned as one of the premonitory phenomena, the patient is suddenly awakened in a few hours by a feeling of strangulation, and finds that the fit has seized him with all its violence. Occasionally, however, the asthmatic will, after awaking, lie in a half-dreamy, half-conscious state, sensible in some sort of the approach of the attack, and yet indisposed to arouse himself and make an effort to ward it off by having recourse to preventives. When fully awake, he finds an oppression of the chest, weighing him down like an incubus, and is constrained to sit up, or to quit his bed at once, if, as he imagines, he would escape suffocation. One of the most ordinary attendants on this disease is an unusual flow of urine of a pale colour; but at the termination of the attack it becomes high coloured, and deposits a sediment. In fits of short duration, on the contrary, such a limpid state of the urine is seldom observed; and the most inconvenient symptom is that of flatulency. A few hours generally bring such fits to a close, and relief is first indicated by the expectoration becoming copious. A disposition to sweat, and irregularity of pulse, are likewise concomitants of these short attacks, which are free from the proneness to sleep before noticed. Sometimes these paroxysms are repeated for some time, with intervals of one or two days, or more. In such cases the pause, or intermission, between each attack, is marked by an abatement of the more violent symptoms, rather than a perfect recovery. The patient will, from the delightful contrast presented by present ease to his recent suffering, feel light of heart, and imagine his restoration to health established; but a nice observer can easily detect the abnormal quality and general irregularity of the respiration.

It deserves mention, that in some instances the violence of the symptoms increases, instead of diminishing, at each successive paroxysm, until the attack has run half its course; and that after this the remissions are longer, and more perfect, until its final termination. When the nervous habit is once established—that is to say, when at some determinate period, or periods of the year, the fits recur, whether in winter or summer, or more frequently, the intervals elapsing between them are not times of complete health. Many indices present themselves to the physician of some disordered state still existing in the asthmatic. Aretæus expressly says—"*During the cessation of the disease, though he may walk out and not be considered ill, still he carries about him the signs of the disease.*" And indeed, in many instances, the countenance, gait, and manner of the patient, indicate but too truly the disease under which he labours. Without, however, going the length of the ancient, but most accurate observer, just quoted, it is certain that some functional derangement, or some confirmed local disease may generally, if not invariably, be traced in the asthmatic. In cases of mal-conformation of the chest there is an obvious cause; but in the absence of every other easily-discerned symptom, a shortness of breath, made evident by the slightest extra-exertion. will prove the asthmatic diathesis. Few, however, who suffer from this disease, are affected in precisely a similar manner. The symptoms are as various as the causes are usually stated to be; and the variations in the duration, and recurrence of the fits, are equally as anomalous. In some, the nervous habit assumes a regular character, and its periodic returns are duly anticipated by the patient. In the great majority of cases, however, much uncertainty prevails on these points.

Independently of the constitutional habit, there is a variety of secondary causes, which have more or less influence in retarding, or accelerating the attacks. For instance, if summer be the period of suffering, (and this is the more frequent one in the purely nervous asthma,) excessive heat may bring on the commencing fit as early as the end of May; but if the weather be cool, it may keep off till the close of June, or beginning of July. In winter, again, the early setting in of the frost, or as the case may be, a continuation of a close, foggy state of the atmosphere, will exert a marked influence on the early or late appearance of the disease, when it co-exists with catarrh. The most violent and frequent attacks occur soon after the summer solstice.

On the abatement of the paroxysm, when it has been severe and of long duration, a sense of soreness, arising from the straining and unwonted exertion of the respiratory muscles, is usually felt for some hours subsequently. Both during the attack, and after its violence has abated, there is a painful feeling of fulness, and of undue distension, in the region of the two solid, floating viscera of the abdomen, the liver and the spleen. This state, as well as the flatulence, and head-ache which I have mentioned as symptoms and attendants of asthma, are, in a certain degree, owing to venous congestion. The flatulence, which medical writers generally put down as a precursory symptom of asthma, is not, I have long remarked, apparent, until a succession of fits has established the dyspeptic habit in the patient; which is the result of the obstruction to the circulation of the blood in the chylopoietic viscera, arising indirectly from the congested or compressed condition of the lungs. To enter more minutely into the causes leading to this mechanical hyperæmia, (in all varieties of asthma lesions of circulation may be traced), and to place the subject in a more distinct light, I shall quote a passage from my Treatise on Consumption, explanatory of the happy effects resulting from free respiration, in order by this contrast to give a clearer view of its contrary.

" The mere expansion of the lungs in the first instance, tends indirectly to remove congestion of the liver, and also of the stomach, spleen, pancreas, and intestinal canal, all dependent on the more free circulation of the blood in the former. The biliary, as well as the great salivary secretion, is hereby promoted to a healthy activity. Such morbid irritability of the mucous membrane of the stomach as may be present, productive of indigestion, is removed; the chyliferous absorption belonging to the small intestines, so indispensable to life, is actively carried on, and the injurious retention of excrementitious matter in the large intestines, is obviated by increased mucous moisture, and accelerated peristaltic motion."

I now proceed to the contrast; and do not know that I can explain the mechanical hyperæmia existing in asthma better than by the following passage from the same work:—

"The blood of the right ventricle of the heart not finding a ready passage through the lungs affected as abovementioned, causes a preternatural quantity of the same fluid in the adjoining auricle, and especially in the two great veins opening into it. The consequences of this state are, head-ache, owing to interruption of the free return of blood from the head; pulmonary engorgement, through the difficulty the bronchial veins experience in transmitting their blood, by either its direct or circuitous course, into the vena azygos; and serious derangement, or actual disease, of the most important viscera of the abdomen. The superior cava, preternaturally full of blood, will, for reasons similar to those just mentioned, produce pain in the head; and, by a similar interruption to the circulation of the vena azygos, besides interfering with the free return of the blood into the bronchial veins, it will, in some degree, impair the activity of the kidneys; the due return of the effete blood of which organs partly depends on the freedom with which it is conveyed from the vena azygos into the vena cava superior."—P. 80. Third Edition.

Pursuing this train of observation, it will not, I think, be unphilosophical to suggest that the great debility accompanying asthma may originate, in some degree, from the want of a due supply of blood to the left side of the heart and the arterial system.

I shall take the liberty of inserting in this place, letters which I received from distinguished ladies, patients of mine, who had been long labouring under severe asthma. I requested them to be so good as to write for me a description of the symptoms, both those which preceded and those which accompanied the fit of asthma, with which request they very kindly and promptly complied. A perusal of these letters will convince the reader of the fidelity and accuracy of the descriptions, as well as of the truth of the poet's dictum—

> "Those best can paint them who have felt them most."

The first is from a lady of high rank; the second came from another lady, a member of a family well known for great intellectual attainments:

"Dear Sir,

"According to your request, I now sit down to write you an account of my symptoms; and as I am sorry to say that I have had one or two slight attacks lately, I can give you them more accurately. I can, in general, with the greatest certainty, predict an attack from my sensations the evening before. There is an uncomfortable feeling in my chest, though not amounting to oppression; I generally go to sleep with this feeling, and awake about four or five o'clock in the morning with an attack on me. This lasts for perhaps two or three hours, and then subsides, when I fall asleep, and on awaking the symptoms are sometimes different; at times the attack comes on again; sometimes it entirely quits me; and at others, leaves behind it a severe headache, but always there remains a confused stupefied feel in my head for the rest of the day, as if I had had a horrid dream or nightmare. When the fit is present I have no inclination to eat; though I recollect that a voracious appetite was one of the symptoms which attended my attacks when first I became subject to them; tea is the only thing I can take. I think the symptoms of my complaint have altered very much; when first I had the asthma, the paroxysms were very violent for the time, but went off entirely in the course of the day; now, however, they are not so severe, but they return sometimes for three or four consecutive nights. Bleeding I find of great service, and, occasionally, an emetic; but no remedy is certain, I think. I feel great relief from making water, and I do this very frequently during an attack. Some paroxysms are attended with violent sickness and retching, without taking an emetic; and then I have sometimes thrown up a great quantity of black bitter matter, which I suppose is bile. I think I have now told you all the symptoms I am subject to, and I hope you will be able to make something out of my ill-connected description. I am yours, &c. "L. H."

The following more minute detail of symptoms is from the pen of the same noble lady:

Sept. 28, 1834.

"At the age of thirteen, the writer, previously very healthy, was attacked with measles, immediately succeeded by hooping-cough, from which she suffered nearly a year, at the end of which time, symptoms of difficult respiration, heat, and pains in the chest and side occasionally occurred, and general delicacy and liability to cold became habitual. At length the distinguishing characteristics of spasmodic asthma manifested themselves: the attacks usually came on after the sudden disappearance of a slight cold in the head, and were commonly removed for the time by antimonial emetics, ether, &c. When about the age of from seventeen to that of nineteen, a great improvement in health was experienced, and for those two years the complaint seemed to have disappeared, though no particular cause was assignable; but at the end of that period a liver affection displayed itself, for which quantities of calomel and the application of moxa was deemed necessary. On the subsidence of this disorder, the attacks of asthma became much more frequent and distressing than heretofore, lasting three days, and arising without a previous exciting cause. The symptoms were extreme pain, heat, and sense of tightness, and as if a heavy weight was placed on the chest; pain in the back and head, irritability of the bladder, and occasionally a bowel complaint, incessant retching and cough, spasms in the throat, and paroxysms of difficulty of breathing, threatening suffocation. The expectoration was generally considerable, of clear frothy matter during the attack. On its subsidence, it became tinged with blood, or streaked as it were with soot."

The wheezing noise in the chest was so loud, as to be heard in a distant apartment, and a sound as if of water was distinctly audible at each inspiration; the extremities were usually cold, though the upper part of the body was in a profuse perspiration during the fit. The disease proceeded to gain ground, and the attacks, though shorter and slighter than those above described, recurred so frequently, that the patient was unable to pass in bed one night in each week, in consequence of the distressing choking sensation produced by the horizontal position. Emetics occasionally relieved, and morphine produced some sleep towards morning; and though the patient felt extremely weak, the asthma generally passed off in twelve hours. A harassing cough invariably succeeded each attack, and usually came on with such violence after eating, that she indeed appeared on the point of strangulation; the windows were obliged to be thrown open, and her stay-lace cut; the spasm in the throat was so violent, that it was alike impossible to speak or swallow; when she had power to do so, a few sips of very hot water generally relieved. The disorder continued to afflict her in this way, producing extreme debility and emaciation, till the birth of her first child, when the patient was about twenty-eight. The symptoms ceased entirely during pregnancy; and for nearly a year, a sensible improvement in health took place. After that period, the attacks recurred with their accustomed violence, generally at periodical intervals, and cough and pain in the right side seldom intermitted. From the time of a third pregnancy, the disorder appeared gradually to subside, and although occasional slight attacks have been experienced during the last two years, they occur at longer intervals, and the cough has entirely ceased. The most distressing symptoms now accompanying the asthmatic attack is intense headache; but the general health is so much improved, that the patient ventures to indulge a hope of its perfect restoration.

The following graphic description of the approach, course, and termination of the paroxysm of asthma, is well deserving of perusal. The most experienced practitioner could not surpass it in the accuracy and fidelity of the detail of symptoms. It is the second case already alluded to.

" Before a fit of asthma comes on, I have, in general, a feeling of fulness and oppression during the evening, and a rising of viscous transparent globules, like isinglass, in my throat and mouth. After my first sleep, I awake with a sense of weight and difficulty in breathing, which obliges me to sit up, and which increases rapidly. It is attended with a relaxation of the uvula, a parched dryness of the throat and tongue, which have the feeling, as well as the appearance of sponge, and a continual action of the kidneys. No expectoration comes to my relief; I am unable to swallow anything, and can but have recourse to inhaling water, either simple or with camphor, laudanum, or fresh ground coffee. An aching chill, especially of the extremities, succeeds the feverishness that ushers in an attack; the labour of breathing is beyond expression, and any exertion whatever frequently brings on a spasm, which lasts about an hour and a half. The sense of actual suffocation compels me to loosen every button and string. Strong poultices of mustard and boiling vinegar are applied to my chest, and occasionally also to my back and ankles, and it has further been found necessary to put my hands and feet into hot water with mustard; but this occasions a degree of fatigue to which I am sometimes wholly unequal, as death seems instantly impending. At times the only relief has been from one or more persons blowing in my ears with the utmost force. When the spasm abates, my temples are bathed with some evaporating spirit for a considerable time, and I then become very drowsy and often sleep for some hours. The spasm sometimes recurs two or three times during an attack, but not often, I find. After two or three doses of lobelia expectoration begins; and then, if the fit has been at all violent, I always throw off a very considerable quantity of mucus quite black, and in the intervals of coughing sleep a good deal. The excessive chill, and the action of the kidneys abate, as my lungs are gradually freed from the weight that clogs them; but extreme weakness succeeds, and I can hardly bear the fatigue of changing my linen and having my bed arranged. However, I rapidly recover, and have been accustomed to enjoy very long intervals of freedom from all asthmatic symptoms. In the course of fifteen years which have elapsed, since in consequence of a violent nervous shock I was first attacked by this complaint, I once passed two years without any recurrence of the disease; at another time ten months, and four or five very commonly; but of late I have suffered almost incessantly, and the lobelia, which used always to relieve me, has lost its power. I was accustomed to take two tea spoonfuls of the oxysyrup of lobelia inflata, with double that quantity of camphor mixture, at intervals of four hours; but for some time after I first began to use it, now about five years since, I often found a single dose dispel every symptom. When I am well, I retain no traces of my disease. I can walk up hill with no more fatigue than others; I can read aloud for a considerable time, and except that I refrain from all fermented liquors, I could almost forget my asthma altogether. Smoke, however, always affects me very sensibly, and all my life I have been subject to severe colds in the head, which usually come on when I get up in the morning, and last about three hours, during which the defluxion is almost incessant. "F. T."

Having thus presented the ordinary symptoms of the disease, it remains to ascertain the state of the respiration afforded by means of auscultation. No disease displays more anomalies in its auscultative diagnosis than asthma. This partly arises from the longer, or shorter period, during which the patient has been asthmatic, and is partly owing to other causes of a pathological nature. It has been stated that the inspiration yields little or no sound; but in several cases of asthma examined by me, I have detected the presence of some mucous secretion in the windpipe. Spasm of the membranous portion of the trachea, as well as that of its bronchial ramifications, is, I am inclined to believe, a general accompaniment of the disease; and this fact is pointed out not less by the impediment presented to the action of swallowing, than by the peculiar manner in which the breath is, as it were, sucked in. The posture, too, in which the patient ordinarily sits, with his head inclined forward, favours this belief: and would seem to shew that the spasmodic contraction of the interannular membrane of the trachea, in some degree at least, induces this position. That the lungs do not receive their normal proportion of air at each inspiration during the paroxysm, is conclusively proved by the absence of the natural distinctness in the inspiratory murmur.

Much variation exists in the stethoscopic signs, from the structural difference in the lungs occasioned by the habitual or rare recurrence of the disease. Thus, as Laennec has observed, the respiration is, in many instances, almost perfectly puerile; although I do not conceive his explanation of this occurrence to be satisfactory. I feel disposed to infer from repeated observations, that portions of pulmonary tissue are at times subject to spasm, and that to antagonize the contraction so induced, the other portions may take on something like a power of expansibility. I have occasionally heard that part which at first gave out a clear sound, afterwards yield one less distinct, and the parts previously in a state of spasm, afford in their turn a respiration almost puerile. It has appeared to me that, whilst the healthy portions of the lung were undergoing distension from the ingress of the inspired air, the emphysematous portions being thus pressed on by the gradually increasing volume of the adjacent parts, had the air imprisoned within them squeezed out; and thus we may fancy a counter-current of air passing out as it were in the face of the column which is entering into the lungs. Nor after all is there anything so very forced in this conception. The function of respiration in a violent fit of asthma is well nigh in a state of absolute suspension, the inspiration and expiration of air are in a manner equipoised; each of these acts is *quàm proxime* abolished for the time, so that there is nothing so very far-fetched in imagining two counter-streams of air going on simultaneously. The possibility of such a suspension of hematosis as is implied in this supposition, is rendered not a little probable by the purple hue of the patient's countenance, etc. in the height of the fit.

The character of the respiratory sound in asthmatic cases varies from a variety of circumstances. Thus the "*rale sonore*," the sonorous râle, so far from presenting one uniform character, is divided into several sounds perfectly distinct from each other. At times, it resembles the sighing of the wind through the trees; at others, that of air violently forced through a tube, as is the case with the bellows of a forge; and at others again, it acquires a sharper sound, something between a hiss and a whistle. The sound is occasionally broken into a kind of gurgling noise, like that made by a small brook; and, in some instances, like that produced by rubbing the finger over paper of a coarse texture, and uneven surface. This difference of sound depends, in a great measure, on the state of the mucous membrane of the trachea; it is also modified by the spasm or spasms of the bronchi themselves, as well as by those of their membranous terminations, and on the quickness with which the inspiration is made. Where the paroxysm has been very severe, and the patient exhibits much debility, as well as when the attack occurs late in life, a subcrepitous, watery râle is sometimes heard, the diagnostic sign of œdema of the lungs. To hear the respiratory murmur in asthmatic, as well as in most other diseases, and more particularly to discern the sound made by the expulsion of air consequent on spasm, an eligible method is to place the ear over the apex of the lungs, or over the fine edges of these organs approaching the sternum.

Another peculiarity, attendant on this disease, will be detected by auscultation; which is the irregularity and unevenness of the heart's action, occasioned by the effort it makes to overcome the pressure made on it by the enlargement of the pulmonary tissue, the result of the imprisoned air. Percussion, in patients who suffer from permanent emphysema produced by a long continuance of the disorder, yields a sound clearer than natural; but in recent cases, I have not observed this to happen. Much has been written concerning the immobility of the chest in asthma; but this is only observable after a long series of attacks, and when the disorder has become habitual. From the over-exertion of the ribs, caused by excessive and repeated anhelation, their cartilaginous extremities undergo ossification; and I have known this to happen before the age of puberty, the patient having been asthmatic from childhood. When the disease dates from an early age, this precocious change of structure from cartilage to bone prevents that enlargement of the chest, usually seen in asthmatics; but the chest partakes of the generally rounded form characteristic of the disease, and which arises in part from the antagonism offered by the muscles of inspiration to the contraction of the lungs. However, this tendency to ossify is not so marked in the nervous, as in other varieties of asthma.

This truly singular and terrible disease, "*morbus maximé terribilis*," as Willis terms it, is not infrequently hereditary; and this, with its fluctuating nature in some, and regular recurrence at stated periods in others, forms another marked feature in asthma. When we meet with cases in which the fits return invariably every month, as they often do at the catamenial period, or at the expiration of a certain number of months, or, as we have it on the authority of Heberden, after every seven years, the regularity of the occurrence coupled with similar phenomena in other disorders, would induce a belief that there were certain laws of nature, independent of the "seasons' difference," common "to mute and to material things," to which the health of man is periodically subservient.

One extraordinary instance of this singular uniformity came under my knowledge in the person of a lady, a patient of mine, who, for eleven or twelve months, had alternate monthly attacks of epilepsy, and of asthma, and this with the greatest regularity; a strong proof, I may observe, of the purely nervous character of the disease.

Bonnet relates, in his "Sepulchretum Anatomicum," that he had met with a case of asthma alternating with dysuria; and we find, in the "Ephémérides Curiosorum Naturæ," an account of an asthma which attacked the patient, the moment he had composed himself to sleep.

Among my own patients, I have lately had a singular example of the mind's forming the essential circumstance of the disease. A female of the upper class of domestics, who was attacked with asthma on her removing to the country, after having lived in the same situation three years in London, without any manifestation of her complaint, was seized, on her return, with a fresh paroxysm, just as she had obtained a new situation. Every thing had been arranged to her satisfaction, and she was on the point of setting off, (it being abroad,) when the poor creature's hopes were destroyed by this untimely attack. Ever since, the same accident attends her, when placed in the same circumstances; and no sooner does she obtain a situation, and is ready to repair to it, than on the very day, and almost the very moment she is about to enter her new abode, her complaint incapacitates her from embracing the opportunity.

Among other cases recorded by Heberden, in addition to the one before alluded to, he states that he has known some patients to remain free from asthma (after having suffered from it several years) for the space of thirty years; and he mentions that one person used to suffer from violent paroxysms for a single day, which would then cease, and after an indefinite period recur for the same brief space, endangering life from their excessive severity.

ESSENTIAL OR NERVOUS ASTHMA.

By this is understood an affection which leaves no traces after it. In this sense I agree with a distinguished French writer in considering the term as synonymous with essential intermittent dyspnœa; that is, an affection which it is impossible in the existing state of science to connect with an appreciable lesion; the other forms of asthma being but symptomatic dyspnœas. This mode of viewing asthma presents many advantages; among others, it leads to restricting the word *asthma* to express a functional disturbance, which we are unable to refer to any particular organ. The existence of essential asthma is now generally admitted. M. Ferrus has made it fall under idiopathic or nervous asthma. He defends his doing so, on the plea that the cases where the true causes of the affection have remained unperceived are very rare, and may be considered as entirely exceptional. It may not perhaps prove uninteresting to inquire, whether there are sufficient grounds for believing that there exists such an affection as *essential asthma;* or, as some persons would prefer to say, *nervous asthma.* In admitting the terms *nervous* and *essential* to be equivalent, it is necessary to mention, that in this use of the term *nervous*, I do not for a moment allude to those nervous disturbances which may be accounted for by lesions of various portions of the nervous system. These are obvious causes and demonstrated by cases mentioned under the article, *Pathology of Asthma.* Such cases come under the head of symptomatic asthma;

what we are here considering is essential asthma, an affection *which may be produced and continue without any appreciable organic lesion.*

With respect to pulmonary emphysema, diseases of the heart, &c., these should be considered as consequences, not causes of asthma. We know that asthma may be accompanied with organic lesions. The cases in which there have been found, either disease of the heart, emphysema of the lung, or an affection of the brain and spinal chord, do not prove that the asthma has been symptomatic. The reality of such a disease as essential asthma, that is, an asthma wholly independent of all observable pathological changes, is vouched for by men of the highest authority. Laennec has mentioned cases in support of this opinion, as have also many others. According to Ferrus, " the cause which produces asthma may disappear during life, without the nervous disturbance which it had occasioned ceasing to recur." Now this would be admitting an effect without a cause; or at least an effect whose cause has disappeared, and which is still felt: I would prefer saying, that in this case the asthma is essential.

The cause of asthma has been sought in an acute or chronic disease of the bronchi. Even supposing such irritation capable of producing the disease, we must still have recourse to a nervous affection of the respiratory apparatus, in order to understand the symptoms; in fact, there must be superadded a peculiar idiosyncracy for the production of asthma. It is not sufficient that the mucous membrane be inflamed, in order that asthma may appear, as we every day see severe cases of bronchitis, and some of them of very long standing, without giving rise to a single symptom of asthma; to have asthma, it is necessary that this irritation should call into play the innervation of the thoracic organs, as has been judiciously observed by the writer above referred to. The opinion that asthma is produced by bronchitis, involves the admission of a double cause. If this theory were true, bronchitis should exist in every case of asthma.

It is well known, that causes acting on the nervous system, are capable of producing fits of asthma. Some of the cases prove this. Violent emotions of the mind, as terror, anger, &c. may give rise to it. Many reasons seem to warrant Cullen and others in ranking asthma among the nervous diseases. But the question is, what portion of the nervous system is its seat? And until this question can be solved, no one can refuse to admit the existence of essential or nervous asthma.

The proximate cause of the purely spasmodic asthma is unknown; but from many reasons that may be grounded on the facts I am about to state, the inference will be that this form of the disorder positively depends on some alteration of the condition of the nervous influence. The suddenness of the attack, the irritable temperament of the patient, the sympathy between the mind and body peculiarly observable in this form, its periodic recurrence, its hereditary character, and, above all, the non-existence in the few instances in which it has been possible to make pathological observations, of any perceptible organic lesion, however minute, all tend to establish the same point.

Nothing can be more various than the origin of this disease, as far as it can be traced. Almost every variety, however, is complicated with cold. Whether it depends chiefly on an affection of the trachea, or of the numerous ramifications of the bronchi, or a peculiar state of the nerves, each or every of these influential and additional causes, is, for the most part, dependent on, or rather is complicated with, cold. Hoffmann observes, "*As cold proves hostile to all nervous parts, so it is found to be in an especial manner most inimical to the chest. Very many cases have been known to me, where, from the too free admission of this single agent, coughs, spasmodic asthmas, and the most violent cases of cardialgia have originated.*" Again he says, "*if there be any of the occasional causes which can bring on convulsive asthma, it is certainly external cold, that unrelenting enemy to the nervous system.*"

Without, however, recurring to authorities, a very little experience will prove that the more ordinary apparent cause is cold. To say positively what is, or is not the cause, I cannot pretend to do; and until we are acquainted with the proximate origin of epilepsy and hydrophobia, I firmly believe this "*opprobrium medicorum*" will not be removed. Some injury done to the nerves of the chest, by cold or other means, would seem to be its most general exciting cause; but in this there is nothing positive. One of the best defined, and most exquisitely determined cases, that ever came under my knowledge, was in the person of a noble lady, wife of an officer of high rank, to whose immediate ancestor we are indebted for a large accession to our Indian territories. Convulsive asthma first seized her after an attack of hooping cough, and I never witnessed the disease of a more purely convulsive, or a more distressing nature. In this lady there occurred a disturbed state of the mucous membrane of the trachea, with a decided catarrhal tendency; but the same symptoms may be noticed in other individuals without the manifestation of any asthmatic disorder.

A peculiar morbid disposition of the filaments of the pneumo-gastric nerve distributed over the mucous surface, such disposition being occasioned by the action of an irritant, may probably exercise some influence in producing convulsive asthma. This supposition seems strengthened by the following case:

"A gentleman, a patient of mine, from making the common galvanic experiment with a piece of zinc and of copper in his mouth, was seized with tic douloureux, and became an intense sufferer from it. He would pass the edge of his nail along his upper lip several times, by way of test, or criterion, of his state; when, if the liability to fits for the time being had ceased, no effect would ensue: but, if otherwise, no sooner was a certain minute point touched than he was thrown into the most acute agony. Coupling this with facts of a similar nature, such as lock-jaw from a trivial wound, we shall have the purely nervous nature of the disease rendered highly probable; and it may, perhaps, be accounted for from an unusual distribution of the nervous filaments, as in the case of tic douloureux just mentioned I would refer the obvious nervous influence to a sentient extremity of the nerve being seated somewhat nearer than usual to the cuticular surface. The laws of sympathetic association of muscular contraction, will thus solve many phenomena of the disease. Although I certainly am inclined to think that some functional disorder, or morbid sympathy, of the nerves of the chest is the more immediate cause of true asthma; yet reasoning from analogy, it is far from improbable that its origin may sometimes be considerably removed from the seat of the disorder. Some years ago I was called to see a female who was suffering severely from tic douloureux. It was not until my second visit that I discovered she had lost a leg, which had been replaced by one of cork. Inquiring into the history of her case, I found that in order to wear the artificial one with the better regard to appearance, she compressed the stump of the amputated limb so forcibly, in inserting it into the false leg, as to constrict the nerves in a very prejudicial manner. At least, conceiving this to be the case, I ordered her immediately to discontinue the use of it; and found, from the relief subsequently experienced by her, that my conjecture was right.

Here was an evident proof of the intimate connection existing between the nerves of remote parts, or rather, as this required no additional proof, of the effect which injury in one place may communicate to a more distant locality.

I may here mention, that having understood from the domestic physician of a gallant nobleman, representative of his monarch in a sister kingdom, and who had lost a limb in the service of his country, that he had become subject to attacks of the same distressing complaint, I related the above case to Dr. M., and had the satisfaction of introducing him to my patient. Whether the hint was acted upon, I cannot say; but from a communication I received, with the thanks of his noble patient, I should trust that it had proved serviceable.

A writer, who appears to have used much industry in collecting materials for his work on Asthma, Dr. Bree, is of opinion that the spasm of the respiratory muscles is an effort of nature to relieve the sufferer. Had he trusted to experience rather than to the dogmas of others, and inclined to fact rather than theory, he would have seen reason to retract this doctrine. Some years ago I inquired of him if he had ever employed auscultation; but he told me a defective state of hearing precluded him from its use. Otherwise the ear would have convinced him, that he had embraced an erroneous view of the subject. But, independently of this, we find that in the humoral asthma, in which the effusion of serum is considerable, the spasms are not very severe; whilst in the fit of nervous asthma, at the commencement of which there is almost always a total absence of serous effusion, and its presence but slightly indicated at the close, the spasmodic convulsion is of the most violent nature.

Following the observations of Dr. Whytt, who truly remarks, that the contractions of the abdominal muscles, and diaphragm, in pregnancy, tenesmus and strangury, are designed for a wise purpose, he quotes from the same writer, with great satisfaction, the following indisputable error, where he asserts that "the increased motion of the organs of respiration in the fit of an asthma are the efforts of nature to free the body of something hurtful."

By parallel reasoning, it might be asserted that the convulsion of the pharynx, consequent on a bite of the hand, for example, by a rabid animal, or the itching of the nose indicative of the presence of worms, were the efforts of nature to relieve the patient.

Because instances of mercy and wisdom are visible in many apparent disturbances of the human frame, it is an abuse of reason to conclude, that no alteration in the animal economy can take place unless to effect a corresponding good. Palsy might, on such inferences, be deemed an advantage; and the spasmodic rigidity accompanying tetanus the means of relief. A little reflection will show, that the inordinate muscular action in asthma is radically injurious. It lays the foundation for an emphysematous state of the lungs, which, although a relative blessing to an individual of a consumptive diathesis, is in other cases anything but desirable. Thus, frequent attacks of convulsive asthma generally end in rendering the disease chronic, and will even lead progressively, in some cases, from pulmonary or vesicular to interlobular emphysema, and so induce the numerous train of ills which are complicated with asthma in its last and worst stages.

It is perhaps necessary again to observe, that convulsive asthma, strictly so called, depends on some cause or causes hitherto unknown; and that whenever the cause is definite, the disorder is a variety, and not a pure asthma. Simulation or sympathy, is an instance of an exciting cause of asthma, as it likewise is in the case of hysteria, and chorea; and apprehension of an attack, the mere nervous dread of its recurrence, will not infrequently bring it on. The purely nervous nature of the disease is still further elucidated, by the paroxysms of asthma being often excited by powerful and penetrating odours, such as those of ipecacuanha, the tuberose root, and other scents which are known to affect some individuals in a very violent manner.

A medical gentleman of my acquaintance was subject to sudden attacks of asthma, but how produced he was long unable to ascertain. At length it occurred to him that he was invariably seized after sleeping in a particular bed, which had been presented to him by the captain of a ship in the Baltic trade. The feathers, from some process in drying, most probably emitted a peculiar smell, and to this he was led to ascribe the origin of his attacks; since on no other occasion did he ever suffer from them.

Here is an exciting cause, to all appearance; but the *modus operandi* of the odour on the nerves is so unknown to us, that we cannot venture to term it an immediate one.

Ferrus, in his ingenious article on Asthma, inserted in the "Dictionnaire de Médecine," has given a case of what he terms idiopathic, or essential asthma, which at the same time that it is instructive, is not a little characteristic of *la grande nation.* The patriotic feelings of the soldier, maddened at the sight of "foreign troops at the gates of the capital," furnish a little touch of the sentimental in the true Gallic vein. The case is as follows:—

"A young officer, full of talent and honour, grievously wounded in the last campaigns, but at the time in good health, returned in 1814 with his family to Paris still occupied by the allied troops. He experienced so great a shock on perceiving foreign soldiery at the gates of the capital, that he was immediately seized with a sense of uneasiness, and his respiration became difficult. This state grew worse, and he had that very night a violent fit of asthma. The following nights he was equally distressed; and the intensity of the symptoms did not decrease until fifteen days after the first attack. M. Corvisart was consulted; and he perceived no certain index of organic lesion. The condition of the invalid was but little benefited by the most enlightened advice, or the most affectionate nursing. He repaired to the south of France for the winter, and entirely regained his health.

"In 1815, the paroxysms of asthma recurred on his experiencing fresh griefs, but with longer intervals, during which his health was good. He was seized, in 1820, with severe intermittent fever of an obstinate character. In the course of a journey which he took during his convalescence, he was again attacked by an asthmatic fit, after taking a warm bath, and subsequently stopping some hours in a place of public entertainment. The expectoration, which did not come on till the morning of the following day, consisted of sanguineous secretion, and in great quantity. No change in the state of the circulation was observable. The invalid continued his journey, had a recurrence of the attack for four or five consecutive nights, and recovered without even observing a strict regimen. During the last ten months, his health has been good; he has devoted himself to numerous active exercises, and experiences no difficulty of breathing, except when mounting a staircase too quickly."

I cannot conclude this part of my subject better than by quoting the words of Delens:

"Finally, it must be admitted that, in some cases, all the researches of anatomists have been fruitless, and persons have been unable to refer asthma to anything but a perversion of the nervous influence, our last refuge in such cases, in order that we may not be obliged to admit with our predecessors *essential*, or *immaterial* diseases, though, to tell the truth, our mode of explaining the matter is not much more satisfactory than that sort of obscurity with which they sought to cloak their ignorance."

Pathology of Asthma. I have already stated that cases of pure asthma are extremely rare; and instances of the death of patients from its attacks so much more so, that the pathology of the disease is mostly conjectural. Out of numerous autopsic examinations which I have made of asthmatics, one only at all approximated to the uncomplicated form.

This was in the person of a female, nearly thirty years of age, who, when advanced about four months in pregnancy, was so overcome with the sudden news of the arrest of her husband, that death was the consequence. She was labouring under a paroxysm of purely spasmodic asthma, from which for some months she had been free, and had been suffering under the attack about ten hours, when the intelligence was communicated to her. Her health previously had been very good, and the asthmatic fits appeared at long intervals only, although always with great severity. The dissection took place about twenty hours after death. So far as I could ascertain, no difference in the symptoms was observable between this fit and her former ones. On opening the chest, about half a pint of serum was found within the cavities of the pleura. The lungs were not collapsed, each nearly filling its own sac. They were somewhat ponderous, and had no cellular attachments, formed by false membranes, the usual result of any pleuritic affection. The anterior edges and part of the summits of both lungs were decidedly emphysematous, presenting large prominences, resulting from the rupture of several small vesicles into one; and numerous white vesicles of minute size, were perceivable beneath the pleura in different other parts. The lungs, on pressure, gave out, here and there, watery cracklings; and the touch of the finger, for a time, produced a visible indentation. On making sections of the lung in different directions, serum gushed out abundantly, frothing like porter; but towards the posterior part of the lung this assumed a sanguineous hue, from the gravitation of the blood towards that region after death. On a close inspection of the ramifications of the bronchi, nothing unusual was observed; but on examining the trachea, a considerable quantity of frothy mucus of singular tenacity presented itself, adhering to the surface of the mucous membrane; and on endeavouring to break the bubbles, they escaped from beneath the finger in the same manner as globules of quicksilver, making allowance, of course, for their viscidity, which retained them agglutinated to the membrane. There was a great diminution visible about the middle portion of the trachea, as if the result of the spasmodic contraction of the posterior membrane, which may have occurred in the paroxysm a little before death.

In the case of an asthmatic, chief-mate of a South-Seaman, and living in the New North Road, to whom I was called in to meet another physician in consultation, similar phenomena were observable. He died suddenly from spasm of the throat, of which he had previously experienced severe attacks; and I found on dissection, that towards the middle of the trachea, the cartilaginous extremities of the rings were drawn nearer to each other, so as to lessen greatly the circumference of its calibre; and viscid bullæ, like those described above, adhered to the mucous surface.

To resume the description of the morbid appearances in the preceding case: neither the epiglottis, nor the parts beneath it, presented any swollen appearance. On examining the heart, its vessels appeared unusually distended with blood, and the pericardium contained about an ounce of citron-coloured fluid. Both the right auricle and the right ventricle were dilated, and displayed coagulated blood, of the colour and consistence of black-currant jelly. A small quantity of serum was infused into the pelvic region, arising, probably, from a degree of congestion having prevailed, previously to death, in the serous membrane belonging to the abdominal cavity. On examining the uterus, the usual appearances connected with its impregnated state were presented. In the grooves of the convolutions of the brain, between the tunica arachnoidea and the pia mater, a small quantity of serum was effused. Save this, the brain presented no unusual appearance.

From these details, I entertain no doubt that the chief and immediate causes of death were spasmodic constriction of the throat, the existence of the tenacious bullæ mentioned above, and sudden supervention of œdema of the lungs, each co-operating to produce suffocation. Indeed, I have seen several cases in which a sudden mental shock befalling individuals long in an ailing state, brought on œdema, which quickly proved fatal, by at once destroying the tone of the capillaries of the lungs.

Reisseissen has so fully proved the muscular structure of the minuter bronchi, which Laennec also has demonstrated on branches of less than a line in diameter, that it would be superfluous to enter upon the anatomy of the part in order to prove its contractile power.

It has frequently occurred to me that there exists a cause, hitherto unexplained, which (in addition to the imperfect supply of atmospheric air, required for the necessary change from venous to arterial blood) would, if verified, throw considerable light on the disease. From the constriction felt in nervous asthma in various parts of the chest, it would seem probable that some portion of the carbonic acid gas, formed in the lungs by the union of the inspired oxygen with the carbon of the venous blood, is retained in the air-cells, part only being given out in the act of expiration. The vitiated air thus detained would considerably enhance the difficulty of breathing; and the irritation communicated both to the bronchi and trachea, by the presence of this deleterious gas would, in many instances, occasion the constriction of those parts through sympathy. The rarefaction of the noxious air so confined would greatly heighten the pains and labour of the chest; whilst in highly-aggravated cases the state, approximating to the asphyxial, which is seen to accompany it, would be satisfactorily accounted for. There are, I may observe, many points of similarity between the symptoms of asthma, when the paroxysms are unusually violent, and those attendant on some forms of asphyxia.

It is generally admitted that the efforts of the muscles of inspiration are directed to overcome the spasm, which is so prominent a feature in the asthmatic fit. Still this being the case, and these efforts being suggested by nature for the relief of the sufferer, one would naturally expect to find him seconding this kindly interposition by every means in his power, whereas we see that, by the position he assumes during the paroxysm—viz., that of leaning forwards, and in some degree diminishing the capacity of the chest, by preventing the descent of the diaphragm—he would seem to act in a manner diametrically opposed to Nature's kind suggestions. This apparent opposition, however, is thus explained: the patient leans forward for the purpose of establishing a *point d'appui* for the inspiratory muscles, and of thus increasing their power; whilst again, by leaning forwards, he limits the amount of air which enters the lungs; these organs being already overcharged with the air detained in the air-cells during the fit, much addition to this would occasion distress. In exemplification of this, we may refer to the custom which hackney-coachmen at times adopt of placing a piece of leather with a small hole in it over the nostrils of their horses, when broken-winded, in order to limit the quantity of air which may enter the lungs.

This will account for the opposition which appears to subsist between the intentions of Nature and the efforts made by the patient. So far as the external muscles are concerned, I have every reason to believe that they are sympathetically affected by the state of the lungs. The tendency of the muscular action to expand the chest must occasion great agony to the patient, by the violence done to the lungs themselves; and the position, I have mentioned above, as being often resorted to in the height of the paroxysm, would seem to be an involuntary act on the part of the asthmatic to prevent an apprehended vacuum, although a vacuum is of course an impossibility. This posture also, as has been already observed, counteracts the descent of the diaphragm, which being spasmodically affected as well as the lungs, would, if unchecked, do the same violence to their fine, delicate, and spongy texture, as the laborious external action of the chest. Indeed, the sense of constriction experienced by the patient, as if bound by cords, which is most acutely felt in a line drawn from side to side across the pit of the stomach is, it is reasonable to suppose, occasioned by the spasmodic state of the powerful muscle of the diaphragm: since the feeling of tension is observed chiefly in the direction of the digitations of its greater muscle, which, proceeding from the cartilages and bones of the six lower ribs, as also from the ensiform cartilage, intermix with the digitations of the transversalis abdominis muscle.

It has been inferred that the muscles of the glottis are the seat of spasm: of a momentary one, in some cases, perhaps, I will grant, but no more; for, it is evident, that spasm of a few seconds' duration would terminate existence. Were I asked my opinion as to the locality of the nervous affection, I should say that it commences in the upper part of the elastic fibrous lamella, which includes the cartilaginous rings, and completes the circuit of the trachea posteriorly: hence it descends into the bronchi, and their ultimate divisions; and like what occurs in colic, when spasm shifts from one portion of the intestines to another, there is an alteration of contractility, as well as of irritability, from one part of the lungs to another. The mucous membrane may not improbably undergo spasm, in conjunction with the above-mentioned parts, and the cellular membrane of the lungs also, without our being able to detect the slightest vestige of muscular fibre, as well as in the air-cells themselves; since we are certain of the vital property of contractility, inherent in animals of almost a mucilaginous consistence.

Nothing can be stronger than this analogy between the spasmodic state of the lungs and that in colic. Its sudden flying from one part to another, the sympathetic relation between the internal convulsion and the external muscular labour, just as in colic the spasm of the intestinal canal is communicated to the muscles of the abdomen, all show by comparison the purely nervous nature of this form of asthma. Two species of contraction—and I am not aware that this has been pointed out before—concur in embarrassing the patient, and increasing the spasmodic affection by rendering it a compound one. The position noticed above, as peculiarly assumed by the patient proves that there exists a longitudinal contractility, from the commencement of the trachea downwards, through the ramifications of the bronchi, even to the aerial vesicles; and from the formation of the above parts, I would infer that there is also a transverse constriction of these parts.

It is, indeed, impossible to refuse assent to this, when the existence of the circular muscular fibres, destined for contracting the bronchi, has been demonstrated by Reisseissen, and other eminent pathologists, to whose testimony I may add that of my own experience, which had led me to the same conclusions some years ago.

Again, this power of contractility is accompanied by that of expansion; and when we consider that the depression of the chest alone could not operate so powerfully as to remove the volume of air ordinarily discharged from the lungs at each expiration, although it doubtless aids in freeing the cells contiguous to its walls, there is an amount of proof, approaching to certainty, that the lungs are more than passive—that they possess an organic power of self-mobility: in other words, contract and expand in virtue of their own inherent properties, as well as through the influence of external agents. It appears to have been generally overlooked, that although the thoracic muscles of expiration belonging to the chest are feeble, when compared with those of inspiration, there is a series of actions dependant on the abdominal muscles, which compensates this want of antagonism on their part. When the attack has been inordinately severe, and the tonic spasm of the trachea strongly marked, I have noticed this action of the muscles of the abdomen, which does not seem to cease until it has operated a transfer of the spasm to some other part of the pulmonary apparatus, or else entirely overcome it.

The anatomist is aware that the action of these muscles is not confined to the viscera of the abdomen, but that their agency extends to the thorax and pelvis. If these be fixed, the abdominal muscles, through their contractile power, can both constrict the chest and compress the viscera; and to their power of effecting these changes I would ascribe the relaxation of the bowels, and the discharge of the urinary vesical contents, frequently observed after the commencement of an asthmatic attack. And when the vertebral column is fixed, the sacro-lumbalis, as also the quadratus lumborum by drawing down the last rib, and having this motion extended to the others through the mediation of their intercostal muscles, become auxiliary to the process of expiration. The notion of the abdominal muscles operating less powerfully, although it is acknowledged that they act more freely than usual in asthma, seems to me groundless, and to have arisen from the not having perceived the exact uses to which they may be rendered subservient in the animal economy.

Continuing the explanation of the anatomical characters of asthma, and proceeding to consider the innervation, or nervous influence, we shall find,—from the intimate connexion of the various parts of the frame, even the most distant, by the wondrous distribution of the nerves—that if one set of nerves be deranged in their functions, they may become a centre, whence, by anastomosis, the others may be sympathetically affected; as, for instance, in the event of cold, or any other exciting cause acting primarily on the surface of the body, and disturbing sympathetically the harmony of the respiratory apparatus.

In order to produce constriction of the bronchial tubes, whether with or without any organic lesion, the pulmonary plexuses, which terminate in fine filaments losing themselves in the lining mucous membrane, are unquestionably concerned.

Let us, in the first place, trace the nerves, which chiefly supply the lungs, through the medium of the anterior and posterior pulmonary plexuses; and, as we know that the nervus vagus, the second fasciculus of the eighth pair, aided by the intercostal nerves, contributes to the formation of each of these; it is then to the course of this nerve that we must look for the channel by which an interchange of sympathy may be conveyed.

Previously to the union of the branches of the nervus vagus, so as to form the pulmonary plexuses, this nerve gives off on each side the inferior laryngeal or recurrent: the one, on the right, to reach the side of the larynx; and the other, that of the trachea. These recurrents, likewise, send off filaments to the cardiac nerves and to the lungs, some of which, besides supplying the trachea and thyroid gland, are distributed to the net-work, formed by oblique and transverse branches from the par vagum, and termed the œsophageal plexus. From the junction of the pulmonary plexuses with the filaments of the cardiac plexus, which latter is chiefly formed from the cervical ganglia, the circulatory functions of the heart will be more or less affected; and through irritation communicated to the cervical ganglia from the pulmonary plexuses, by either the recurrent, the superior laryngeal, or the other branches of the vagus, &c., the larynx, trachea, pharynx, and œsophagus will share in the affection.

The actions of the muscles concerned in respiration, are chiefly governed by the connexion of the par vagum with the sympathetic, the phrenic nerve, the external respiratory nerve of Bell, as well as with the spinal accessory, or the superior respiratory nerve, of the same distinguished anatomist, &c.; and thus, by the distribution of this division of nerves to the larynx, as well as the pharynx, and their prolongations on the anterior part of the neck, the occurrence of spasm in these parts is easily accounted for.

Again, from the close connexion between the larynx and the eighth pair of nerves, many of whose branches anastomose with other nerves concerned in respiration, we can at once account for the mode in which the whole respiratory system is called into action. The intimate union of the par vagum with the glosso-pharyngeal branch of the eighth pair, and this, by its communications with the other lingual, as well as the facial nerves, also explains the association that exists between the alterations occurring in the deglutition, countenance, voice, &c.

The operation of any ingesta, or of medicine, on the stomach in asthma, or the irritation communicated to the chest when this viscus is deranged, is forwarded through the medium of the par vagum, which supplies it, as well as through the œsophagean plexus of the same nerve. So, likewise, the transmission of the influence of a morbid condition of any of the organs of the abdomen, or the pelvis in part, to the thoracic, cervical and cranial regions, or *vice versâ*, is referrible to the distribution of the secondary plexuses of the great solar plexus to those organs: whence the action is carried upwards by means partly of the vagus nerves, and subsidiarily, in one direction, by the phrenic nerve, some of whose branches are supposed to communicate with the solar plexus, through the diaphragm, and which nerve passes in front of the root of the lungs, as we trace it upwards to its origin from the third, fourth, and partly the fifth cervical nerves. In another direction, a continuous sympathy, with any derangement of, or action, on the stomach, may be communicated from the semi-lunar ganglion, through the greater splanchnic, which is given off from a variable number of the internal branches of the thoracic ganglia; through these last, the intercostal nerves are also excited, and the action is carried up directly to the cervical region, through the medium of the inferior and superior branches of the last-named ganglia, as far as the junction of the first thoracic with the inferior cervical ganglion. Hence the link of sympathy continues to be formed by the middle and superior cervical ganglia.

Regard for the time and patience of the reader compels me to bring this—to him, I should presume—somewhat lengthened detail to a close. Its importance, however, would prove a sufficient excuse, if we were to give even a more extended examination. I shall, therefore, only add, that the region of the kidneys may, in some degree, be brought to sympathize with any of the deranged functions hypothetically stated above, through the lesser splanchnic; which, formed by the union of two or three twigs from the last thoracic ganglia, gives off one branch to the semi-lunar ganglion, and another to the renal plexus.

I shall here present a conspectus of the leading theories proposed by the most distinguished pathologists of their day regarding the nature and seat of asthma. The importance of the subject will, I trust, serve as my apology for having entered so much into detail on the matter. The theories of the older physicians, as being founded entirely on the humoral pathology, I shall not, of course, dwell on. Hoffmann refers asthma sometimes to mucus, which irritates the bronchi; occasionally to a spasmodic state of the respiratory organs. Willis assigns to it a double origin; in the first there is narrowness of the bronchi, from obstruction or contraction of the air-tubes; in the second, which he calls *convulsive*, the morbific cause may arise from a collection of serum contained in the brain, the spasmodic particles of which are diffused through the nerves of the lung. Bonetus insisted more particularly on spasmodic contraction of the bronchi. According to him, the tubes of the trachea, being convulsively affected, contract with force, and prevent the free entrance of atmospheric air: he admits, however, that other causes may occasion difficulty of breathing. Cullen advocated the spasmodic nature of the affection, which he considered to reside in the muscular fibres of the bronchi. Reisseissen and Cruveilhier maintain that asthma depends on narrowing of the bronchi and spasm of their muscular fibres. Rostan will have it that asthma is always the symptom of a disease of the heart and vessels. Georget connects it with a disease of the brain and spinal cord.

Broussais refers it, as is well known, to a spasmodic state of the heart. M. Begin makes asthma consist in an irritation seated in the pulmonary mucous membrane, an irritation which excites sympathetically the contraction of the muscles of the bronchi and thorax. Laennec considers catarrh and pulmonary emphysema as the most ordinary causes of asthma. We shall make a few remarks on the most important of these theories separately, and shall first consider that which makes the disease to consist in spasm.

Spasmodic contraction of the bronchi.—The principal abettors of this theory were Van Helmont, Bonetus, Willis, Hoffmann, and Cullen: Ryan attributes the disease to the impression of cold air on the lungs, and to tonic spasm of the organ, which is its consequence. M. Lefevre expresses his opinion in the following words:—"Asthma is owing to a spasmodic contraction of the bronchi, which may be produced by all the causes which act either directly or sympathetically on the pulmonary mucous membrane." M. Begin also conceives that the contraction is but consecutive on an irritation of the mucous membrane. M. Bricheteau and Lefevre coincide in this view of the matter. Among many other arguments advanced by the latter physician, we may mention the mode of action of the determining causes of the fit. Irritating particles, solid or gaseous, variations of temperature, and all the causes which act directly or indirectly on the mucous membrane of the lungs, bring on the attacks. It is in this way also alcoholic drinks act: the pulmonary mucous membrane being one of the principal passages of exhalation for all substances carried into the torrent of the circulation, it must be much irritated by the passage of the alcoholic vapour. We shall now consider the theory which makes asthma to depend on cardiac disease.

Organic Lesion of the Heart and Large Vessels.—This opinion was maintained by M. Rostan; he would have it that all asthmatics always presented certain diseases of the heart and vessels. He quotes cases in which post-mortem examination discovered hypertrophies of the right or left ventricles, or of both, and ossifications of the aorta. This statement was opposed by Begin, Bricheteau, Bland, and others. The arguments of the opponents were as follow: the spasm of the bronchi observed in persons labouring under diseases of the heart has quite a different character from that which constitutes essential asthma; the asthma of persons with cardiac disease has not the quality of periodicity well marked; the paroxysms come on by day as well as by night; there is not that feeling of sub-sternal constriction so well marked in true asthmatics; patients with heart disease find relief from their suffering in sleep, whilst the asthmatic attack comes on at midnight. Auscultation detects differences still more striking between the two diseases. In asthma, the chest is sometimes more sonorous than in the ordinary state, and less so in cardiac disease; in the latter, the pulse is unequal, intermittent, and irregular; face puffed, limbs infiltrated. Another objection advanced against Rostan's view is, that lesions so variable as those found in persons who die from disease of the heart, should not give rise to symptoms always identical; again it must be difficult in cardiac disease to account for the progressive rarity of the paroxysms as age advances. Another objection is, that in many cases of asthma the most careful examination has been unable to detect any lesion of the circulating organs to account for the asthmatic paroxysm. In essential asthma, the symptoms, howsoever severe, never appear to threaten the patient's life; whilst in asthma connected with cardiac disease, the termination is almost always fatal. All these facts are so many proofs of the existence of an essential asthma. Others connect asthma with emphysema; Laennec, in fact, says he is convinced that many cases of asthma, supposed to be nervous, are attributable to this cause. It must be admitted, however, that generally the emphysema is consecutive to the asthma. The violent efforts of inspiration made by asthmatic persons, and the difficulty which the air encounters in escaping during expiration, will at once explain why emphysema may very well be a consequence of asthma. Laennec considered spasm of the bronchi and catarrh as causes of emphysema. In catarrh, the bronchial mucous membrane, swollen and thickened, gives passage to the air with some difficulty, which air, however, ultimately makes its way by virtue of the inspiratory powers, but the gas then remains imprisoned, because the expiration is not strong enough to expel it: it then becomes dilated from the heat to which it is subjected, and becomes a cause of distension or rupture of the bronchial cells. Spasm of the bronchi acts in precisely the same manner in producing emphysema, which is then but the result of the disease.

Pulmonary emphysema gives rise to symptoms which have more than one point of resemblance to asthma. It is well worth remarking that alterations, sometimes considered as the causes of asthma, are frequently only its effects. Symptoms, as serious as those of asthma, and which seem every moment to endanger the patient's life, cannot last for any time without occasioning disturbance. The spasm of the muscular structure of the bronchi and thorax prevents the blood from passing freely through the lung; this fluid then accumulates in the vessels, and more especially in the pulmonary artery and its branches. The ventricle, compelled to redouble its efforts to overcome the resistance opposed to it by the blood, dilates, and its tissues become hypertrophied. These changes soon extend to the left cavities.

Those who set down as one of the causes of symptomatic asthma certain organic changes of the nervous system, find themselves not a little puzzled when they come to consider the nature of *idiopathic asthma*, which, if it mean anything, must mean that form of asthma which is confined to the parts whose functions it disturbs. Whilst we are ready to admit the great advantages to be derived from the researches of pathological anatomy in other diseases, we cannot deny that in investigating the nature of what are considered nervous diseases, this branch of science can only be regarded as a powerful auxiliary. In fact, pathological anatomy is neither the only nor the best means of determining the point of departure of the diseases of which the nervous system may be looked on as the seat; still we are indebted to it for some important facts on the etiology of idiopathic asthma. Thus, Willis having found serum effused into the cranium of an asthmatic subject, explained by this circumstance the cause of his having been unable to breathe whilst lying in the horizontal position. Georget observed a change in the colour and consistence of the brains of some asthmatic patients. M. Ferrus found, in an asthmatic patient, an extensive ossification in the centre of the pulmonic plexus, which compressed some of the nerves of this plexus. In a case of fatal dyspnœa, Professor Beclard, whose lectures I formerly attended when in Paris, found no other lesion except a tumour on one of the diaphragmatic nerves in a case of fatal dyspnœa.

Experiments have been resorted to in order to obtain an insight into the pathology, or proximate cause of asthma. The principal phenomena in this disease may be produced artificially by ligature or compression of the nerves going to the lungs. Dupuytren proved that section of *all* the nerves going to the lungs is necessary to destroy the animal quickly by suspending the function of hematosis. He also found that compression produced more rapid and dangerous effects than section. He was able to bring on moderate spasms of the respiration by increasing or diminishing compression of the pneumogastric nerves. Ligature or compression of the eighth pair produces convulsions of the muscles of respiration, as well as sanguineous pulmonary engorgement, and a black colour of the blood in the arteries. By connecting these facts with those furnished by pathological anatomy, it is supposed that an organic origin may be traced out even for asthma, when it is not symptomatic. Some persons, induced by the nervous symptoms presented in asthma, have referred it entirely to disturbance of innervation.

In a word, nothing can be more variable than the anatomical traces described by authors who have written on asthma, nor anything more unsatisfactory or indeterminate on the subject. One adequate cause has been assigned for this: viz. the opportunities for observing the true anatomical characters of the disease are not frequent, for this reason, that, on the one hand, the disease is rather uncommon, and but seldom fatal in itself; whilst, on the other hand, the asthmatics who die after a longer or shorter time almost invariably present organic diseases, the onset of which must be enveloped in great obscurity.

Having now dwelt, more fully I believe than the generality of writers on the subject, on the anatomical characters of asthma, I shall take the opportunity, before I enter upon the consideration of its diagnosis, of making a few general remarks, in addition to my preceding observations on its pathology.

I have before adverted to the operation of mental causes in producing this disorder. Various passions of the mind contribute, in numerous cases, to generate, or rather to predispose to asthma; and, among these, there is one whose agency has not, perhaps, been sufficiently attended to.

A very natural mode of accounting for the progress of this complaint, as it degenerates into a periodic one, is, I would suggest, to refer to one of the most powerful passions which agitate the human frame—fear, a fear, too, that in some temperaments may insensibly operate almost from the termination of one attack to produce another. However, although this, generally speaking, is a not improbable account of the mode in which this disease may at times become periodical, I am not so wedded to theory as to deny that there are many cases in which all close reasoning on the subject is baffled.

From the time of Willis the nervous nature of the disease has been generally recognized, and, in his concise description, he notices this tendency of the mind to bring on the asthmatic access. "*Whatever causes effervescence in the blood, and excites it to a state of orgasm, as for instance violent movements of the body or mind, * * * brings asthmatic attacks on those who are predisposed.*"

Dr. Bree gives us two or three interesting cases, which well exemplify the influence of imagination on the body. "A lady had been thrown into terror," he relates, "by a footpad, and, for the first time, sustained a series of hysteric fits. Her constitution became feeble and acutely sensible. The disease returned, on smaller alarms, for many years afterwards, and particularly in consequence of slight circumstances which referred to the attack, though entirely distinct from it. After three years, during which interval she had diversified her impressions in a distant neighbourhood, she passed in a carriage along the road, and near to the spot where the assault had been made; when, affected by the chain of ideas, and her attention to them, she relapsed into strong convulsions."

Another striking instance of the force of habit is thus narrated by the same writer. "A female had been long subject to dyspeptic complaints, and to irregular secretions of bile. She married at twenty-five years of age, and then found it necessary to employ herself in business, and to attend with great care to an increasing family. These objects gave her the most care on Sundays, on which day she gradually became more indisposed with hemicrania; but, on the other six days, she had her usual health. In ten years the complaint was much aggravated, and it affected her earlier by a few hours, but did not cease sooner than before. In this form the intermittent disease continued for several years, evidently excited by the great anxiety and fatigue of one day in the week. Her situation was again altered: Sunday became a day of rest, and an improvement of circumstances diminished her general anxiety. It might be supposed that the hemicrania would be lost with the impressions which brought it on, but it still returns at its former periods, being linked with ideas of relation that arise from external circumstances. It is probable," continues the doctor, "that a complete change of residence, by which the impressions might be obliterated, would destroy the force of habit, and overcome the disease."

A physician of some repute at Kilkenny, and who wrote on asthma in 1792, gives several cases in which the operation of mental anxiety in generating pure asthma is obvious; although no particular stress is laid on this, as an exciting cause, by the writer. "Mr. H.," he writes, "ætat. 30, of a melancholic temperament, and subject at times to vomitings, lowness of spirits, giddiness, and other symptoms of hypochondriasis, at length was suddenly seized with a slight fit of the asthma, about twelve o'clock at night. About the same hour every night for the space of three weeks he had an attack, and every succeeding one was more violent than the former."

This case will, I think, fairly come within the limits of the theory suggested by me a page or two back. The apparent cause of the primary attack was that inexplicable action of the mind on the body, which we feel but cannot comprehend; the succeeding ones may be referred partly to fear, and partly to the latent presence of the seemingly removed disease, which, as has before been stated, is frequently existent in numerous instances, when the restoration to health is presumed to be certain. One of the most curious instances of nervous apprehension which I have met with is in the person of a patient of mine, who never ventures to walk down the Kingsland-road, as the sure consequence of this promenade is a fit of the asthma. So sudden is the effect of this unfortunate association, that he cannot proceed more than a mile from Shoreditch church without experiencing the presence of the "foul fiend." In this case, too, although the attack appears to be almost instantaneous, we may be sure that fear is operating upon him from the moment he knows that business may force him to take this obnoxious way. His own impression is, that it is the coldest road about London, and that he invariably catches cold as soon as he visits its dreaded precincts.

Laennec relates a curious anecdote of an aged nobleman, who had been subject to slight cough for thirty years, with expectoration of a pituitous nature in the morning. His asthmatic attacks were, it seems, infrequent; but if, through any accident, the bed-room door was inadvertently shut, or his night-lamp had gone out, he was certain to awake immediately with a feeling of suffocation, and in a few minutes after to become insensible.

It appears highly probable, from the circumstance of the door of the bed-room being left open at night, as well as the having a light constantly burning, that there must have been some superstitious fear, or perhaps dread of thieves, uppermost during the "watches of the night," in this gentleman's mind. There was evidently some mental cause which made "his seated heart knock at his ribs against the use of nature." As to his sudden awaking, that may be easily explained. The noise made by the closing of the door, or the smell of the expiring lamp, would be sufficient to wake from uneasy slumber a person so nervously constituted. His alarm would be at once excited; and, under so powerful an agent as fear, the asthmatic symptoms, in one predisposed to them, would be speedily developed. This solution, too, is strengthened by the deliquium which followed.

Another singular instance of the influence of habit, or rather of the generation of an essential asthma, through the ultimate effects of long ill-health on the nerves, is given by Dr. Whytt in his work on the nervous system. "A girl," he writes. "healthful, well-made, and of a seemingly good constitution, began, at the age of seven years, to complain of a pain at the lower part of the sternum; this pain, which returned after no certain intervals, became gradually more severe during the space of nearly two years; after which, in place of it, the patient began to be affected at times with a difficulty of breathing, which returned frequently, without observing any certain periods, since a week, a fortnight, or a month would sometimes intervene between the fits. She was generally seized with the fits all at once; and, after breathing with the utmost difficulty for half an hour, sometimes more than an hour, she would of a sudden become perfectly well, and fall a-dancing immediately after with her companions. It was observable that this girl had no complaint of her stomach, no cough, nor other apparent fault in her lungs; nor did she usually expectorate phlegm when the fit went off: and, except in time of the asthmatic paroxysm, breathed with the same ease as any person in perfect health."

Nothing can prove more clearly the difficulty attending pathological inquiries, and the disappointment frequently experienced in their result, than the fact, that from the time of Willis, who was the first to observe the nervous character of uncomplicated asthma, down to the publications of Laennec and Andral, no light has been thrown on this seemingly inexplicable disease from morbid anatomy. All agree that it is impossible to discover any lesion, or from any *post mortem* examinations to assign any cause for the presence of the disease.

By way of illustrating this continued ill success, and at the same time to point out how even failure in these researches may contribute to the eventual advancement of science, I shall give a few quotations from the cases adduced, and the reasonings entered into by these celebrated physicians at periods so far removed from each other. To give the older writer the precedency: Dr. Willis describes, amongst others, the following case:—"*An interesting young lady, of a delicate constitution and florid countenance, who was scarcely more than ten years of age, began to be attacked severely with asthmatic paroxysms, and remained subject to them for about four years before she was committed to my care; sometimes, after an attack of this disease, she continues free from it, &c.*" He proceeds to state that, from various causes, the paroxysms often assumed the severest character, and would last for seven or eight hours. At first these attacks would be repeated every week or fortnight; but after, (to use his own phraseology) "*the violence of the disease, its material being expended on several such paroxysms, passed away,*" she would remain for months at a time without their recurrence. Of this, and other similar cases, he observes, "*in these cases also, nothing appears more manifest than that the cause of the disease, being without any inflammation or any viscid humour obstructing the lungs, is confined to the nervous system; and that dyspnœa of this kind, being purely convulsive, is brought on in consequence of a spasmodic affection of the nerves of the lungs.*"

In support of this truth, as he declares it to be, he brings forward an examination after death, communicated to him "à Medico Doctissimo D. Gualt. Needham," which he details as follows:—"*A respectable person stated that he knew a butcher in Staffordshire, who, after having long suffered from periodical asthma, which generally recurred at intervals varying between fourteen to twenty days, at length expired in the midst of a paroxysm. The post-mortem exhibited all the viscera healthy, especially the lungs, nor were there any traces either of phlegm in the bronchi, or of congestion of the veins. The only unusual appearance was, that the gall-bladder contained a great many gall-stones. Everything else (adds he) was to be attributed either to an affection of the nervous system, or to some cause unknown to us, or at least not visible.*"

The presence of calculi, as far as regarded the asthmatic disorder, could have had little or no effect; and so Willis would seem to have considered, from the slight notice he gives to the circumstance. From the imperfect state of pathology at the period, it is far from unlikely that other appearances, which would have changed the aspect of the case, were overlooked; though, indeed, the same might occur in our time.

To come to a more recent date. Laennec, as we have seen, states that cases have been carefully examined by him in which, after the minutest research, he could discover no organic lesion to which the asthma was referrible. He quotes, in confirmation of this, a case recorded by M. Andral, in which a suffocation supervened to the stoppage of a discharge from an ulcerated leg; and, on examination, the lungs were found to be sound, with the exception of a small hepatized point in the left lower lobe, of less extent than the tenth part of the lobe, the heart and other organs being sound.

Thus far, we see these writers agreeing in the pathology of the disease and its uncertain nature, when the lapse of nearly two centuries between them would lead us to the supposition that an increase of knowledge would have given more certainty to the subject. I have stated that even failure may contribute to the progress of science, and I think I shall be able to verify the assertion in this instance. Reflecting on the strangeness of the existence of a disease without any morbid phenomenon, and led likewise to prosecute the inquiry by cases which have convinced me that a state existent previously to death may be completely obscured afterwards, I feel confident that there are cases in which an œdematous condition of the lungs is an attendant on this form of asthma in its aggravated stage; but that the active absorption which takes place immediately after death has prevented its being observed. This condition, too, is the more likely to have escaped notice, from the rarity of the instances in which dissolution is the immediate consequence of nervous asthma.

It is much to be regretted that our own writers on this disease should not have been more anxious to investigate its pathology than their works would evidence. From many circumstances in cases detailed by them, I am induced to believe that many important states have been either overlooked or misunderstood. Had due attention been given to the subject from Willis's time to the present, we should have had a rich harvest of facts on which to reason.

As it is, we are presented with innumerable details, gleaned from the works of men who wrote at a period when the art of minute dissection was in its infancy; and when, therefore, many appearances necessary to a full understanding of the case must have escaped notice.

Dr. Bree gives us many such; and what he relates, as coming under his own experience, is far from unexceptionable. Indeed, his pathological views are altogether meagre and irrelevant; those cases which he adduces as belonging to the uncomplicated form, being really symptomatic.

The two cases recorded by Dr. Millar, bear full and explicit testimony to the contempt which he seems, from an overstrained interpretation of the words of Celsus, to have imbibed for morbid anatomy. The Roman writes, "*Nothing can be more stupid than to expect to find in a man who is dying, or even already dead, the same thing that exists in him when alive;*" from which Dr. M. would infer that pathological inquiry is a species of stumbling block in the way of science. He says, "the only dissection I ever made in this disease was of a child, &c." The other he gives as reported to him by others.

Now, it is evident from this modicum of experience possessed by him, that he could not have understood the appearances of the parts when presented to him; and it is most probable, that the disease he took for asthma was some tracheal, or bronchial, or some inflammatory affection.

A work on asthma was published in 1786, by Thomas Withers, physician to the York County Hospital, which is a most curious production. Case after case is brought forward by this practitioner, with the most imperturbable gravity, in which he solemnly relates the symptoms of what he is pleased to term convulsive asthma, accompanied by spitting of blood, &c.; and assures us of their having been cured by the exhibition of James's powder, and similar remedies.

To those who have read my work on Consumption, I need hardly point out the fact, that in those instances, his several patients were actually consumptive, and were cured by the supervention of the catarrhal state, which the learned doctor imagined to be asthma. Had he consulted nature, and pursued a course of pathological examinations, he might have anticipated what I have since discovered, that in asthmatics of some standing, the lungs are always voluminous, and that by becoming so, the progress of phthisis has a fair chance of being arrested.

It may not prove uninteresting to quote a few of his cases, as strongly confirmatory of my views on consumption. In Case 32, he states that John Moor had convulsive asthma, complicated with spitting of blood, a pulmonary consumption, and an abscess in the lungs, which last broke and discharged a considerable quantity of blood, purulent matter, and skinny membranous substances. This was cured by tinctura thebaica, milk diet, and gentle riding exercise.

Of case 34 he says, the convulsive asthma, complicated with pulmonary consumption, succeeding an inflammation of the lungs, treated successfully by tinctura thebaica, cordial mixtures, laxatives, and country air.

Case 45 is the convulsive asthma, complicated with an abscess in the lungs, and a spitting of blood, along with a symptomatic fever, cured by James's powder, &c.

In case 46, we find the convulsive asthma, complicated with a fever, spitting of blood, and ulceration of the lungs, cured by James's powder, and tinctura thebaica.

And, to end this "strange, eventful history," we have, in Case 48, the convulsive asthma, complicated with a spitting of blood, and a quotidian intermittent fever of three months' standing, cured by the Peruvian bark.

More might be selected, bearing on the same point; but here are sufficient for the purposes of proof and instruction. It is strange what wonderful qualities are here ascribed to James's powder, bark, and tinctura thebaica! in modern phraseology, laudanum; or, in medical parlance, tincture of opium. It requires no reasoning to convince any one capable of "discourse of reason," that there must have been something more powerful at work than these remedial agents.

The supervention of catarrh, attended with difficulty of breathing, we must presume, stopped in the first instance the consumption, possibly even to the healing of a cavity; and the catarrh, doubtless, subsequently yielded, in part at least, to nature and the approach of fine weather. But I doubt much his cures of asthma having been permanent. If they were, in the majority of the cases, the consumption must have been renewed, and death have ultimately followed his officious interference.

This same Galen of the north gives an amusing specimen of his skill in conducting pathological inquiry, in the examination of the body of one John Strickney. All that he appears to have found was water—water in the abdomen—water in the chest——water in the pericardium—and, had he opened the cranium, he would doubtless have found water there also!

On the whole, he appears to have been just as fit for the situation he held of physician to a county hospital, as many of the metropolitan ones of the same period, who, whatever their scientific pretensions may have been in other respects, had a most religious horror of disturbing the peaceful repose of the dead.

To bring these somewhat desultory remarks to a conclusion. The predisposition to asthma is very generally apparent in individuals of a peculiar form of nervous constitution, and a characteristically morbid temperament. In numerous instances, it may be traced to the transmission from parent to child, of the nervous susceptibility of receiving impressions injurious to the respiratory functions. How frequently indeed do we see a kind of general disposition handed down, from one generation to another; sometimes immediately, at others with the intermission of one or more generations. And we frequently find that the more similar the moral, no less than the physical organization of two individuals, the one in the ascending the other in the descending line, the more probable is it that the latter will inherit the morbid peculiarities of the former.

In confirmation of his views of the hereditary nature of asthma, a foreign medical writer gives the following curious history: "A child, born of non-asthmatic parents, contracted dyspnœa through exposure to cold, and subsequently became a prey to chronic asthma. On arriving at puberty, the fits diminished in intensity; and, after marriage, through great care and a strict regimen, his sufferings were sensibly ameliorated. He had three boys and four girls, of whom three of the girls became asthmatics. One of these, whose fits of asthma were always brought to a close by a mucous expectoration, had, in the course of time, several daughters, of whom the youngest only inherited her mother's complaint; and this she did in every particular. The eldest of her daughters married a young man, equally as exempt from asthma as herself; and out of a family of six children, the fourth became asthmatic, precisely in the same degree and manner as his grandmother."

We do not find in this singular family history, that any of the descendants of these asthmatic progenitors ever became consumptive.

Though we acquiesce in the propriety of considering these cases as belonging to genuine asthma, the probability is, they were neither more nor less than instances of catarrhal asthma, to be met with every day and in every family, and bear very little analogy to the pure asthma, one of whose leading characters may be hereditary transmissibility.

Diagnosis.—With respect to Diagnosis, it may be laid down as a rule, that when during the intervals between the asthmatic paroxysms nothing indicative of disease is observed, the affection may be considered to be essential or idiopathic—that is, exempt from any perceptible organic lesion; but when, during these intervals, we observe evident signs of lesion of the heart, lungs, &c., it is only by attentively examining the actual symptoms, and carefully comparing the latter with the history of the case, that we can determine whether these lesions are effects, or causes, or only complications of asthma. The dyspnœic phenomena resulting from these lesions differ in some respects from those appertaining to idiopathic asthma:—1st. In the latter case there is neither palpitation of the heart, nor irregularity of the pulse; the face is neither swollen, nor red—it is rather thin and pale. The contrary takes place in those cases of asthma which are symptomatic of disease of the heart or aorta: the palpitations—the dulness, more or less extensive, of the cardiac region—the irregularities of the pulse—the changes in the face, as, for instance, the lividity and swollen state of the lips, &c.—the infiltrations of the subcutaneous cellular tissue, &c., must always prevent us from confounding these two species of asthma. The vast importance of forming an accurate diagnosis between idiopathic and cardiac asthma induces me to discuss this point more in detail.

Dyspnœa and asthma.—Dyspnœa is a generic term including every kind of difficult breathing. Asthma is a dyspnœa of the most obstinate form, marked by an almost complete absence of fever, only the pulse is accelerated a little, as in all nervous affections. Several cases of dyspnœa come more properly under what has been termed *spurious asthma*; and the chief lesions occasioning this symptom are cardiac diseases, hydrothorax, or any obstacle to the free ingress of air into the chest, as enlarged tonsils, &c. A striking character which distinguishes asthma from dyspnœa is its remittent and periodical course, and the termination of the fit in a return to health; finally, the laryngeal and tracheal sifflement, the violent and almost insurmountable spasmodic contraction of the muscles of the chest, will assist us in recognising asthma, and so distinguishing it from mere dyspnœa. The history of the case will of course be always kept in view. The following unmetrical distich contains the diagnosis between asthma and dyspnœa:—

> "*Dyspnœa se celat, clamat asthma, malumque revelat;*
> *Exirat late, trahit ad se cum gravitate.*"

Distinction between true Asthma and cardiac Asthma.—From the intimate connexion which is known to exist between the organs of respiration and those of circulation, it may be legitimately inferred, that the existence of asthma, as an idiopathic disease, must interfere more or less with the functions of the latter; and, for a similar reason, the presence of disease of the heart, or of the great vessels immediately connected with it, must exercise considerable influence on the organs of respiration. Notwithstanding this reciprocal reaction of these two sets of organs on each other, and the secondary set of morbid symptoms resulting therefrom, it will be found no very difficult task to distinguish the organs primarily affected. In the first place we have a sense of oppression, of suffocation, as also cough and some kind of *râle*. Now it is manifest these symptoms belong, directly and immediately, to the organs concerned in the function of respiration, whilst another series of symptoms—such as the abnormal pulse, the morbid pulsation of the heart, the unusual fulness of the vessels of the neck, and that feeling of distress so peculiar to cardiac disease—must be referred to the central organ of the circulation. If, then, the practitioner find the latter symptoms to exist in asthma, he will consider them as merely secondary effects of the lungs on the heart; and if, on the other hand, the former occur in cardiac disease, he will naturally conclude them to be the results of the disturbance produced on the lungs by the heart. Hence it is that in idiopathic, or proper asthma, the pulmonary symptoms predominate, whilst in disease of the heart the cardiac symptoms hold a prominent place. No doubt the patient labouring under proper asthma has many of the cardiac symptoms—as, for instance, the feeling of distress—but not until his disease has lasted a considerable time; whilst the cardiac patient complains of this feeling of distress *ab initio*, from the very commencement of his paroxysms, and is totally unable to suppress it for a moment. The cardiac patient refers his uneasiness more directly to the organ really affected, whilst the asthmatic patient complains more of a sense of squeezing of the chest and of want of air. The beat of the radial artery, as also that of the heart, undergo frequent changes in asthma: such changes, however, are confined to a quicker, fuller, and a spasmodic beat, and it is only in its extreme degree the heart's action becomes irregular;—in the cardiac invalid the irregularity of the heart's beat is observable from the commencement. The purely cardiac patient suffers from no real stoppage of the breath: there is observed in him no real obstacle to expanding the chest, no inequality in inspiration and expiration, no decided *râle*, as in the asthmatic. Asthmatics are unable to take in a deep breath; cardiac patients, on the contrary, can do so. Cardiac sufferers pant and breathe like persons who have run very quickly; a close observer will also notice in them a certain degree of effort when they speak, as well as some degree of haste. In asthmatic persons every breath is accompanied with a rattling or wheezing, which seems to occupy the entire air-tube, and also a peculiar cough, followed by more or less mucous expectoration; whilst in cardiac patients the slight, scarcely audible wheezing, is confined to the larynx, or superior portion of the trachea: the cough also, if it exist, emits as it were a metallic clang of the air-tube, and is accompanied with a scanty, sanguineous, serous, or thick expectoration. For several points of diagnostic importance in this paragraph I am indebted to a learned writer in a foreign work.

Catarrh and Asthma.—Acute catarrh has been confounded with asthma; and it requires close examination to decide whether there exists essential dyspnœa, or whether the symptoms do not depend on inflammation of the larynx, or of the trachea. In this inquiry the attention must be especially directed to the state of the circulatory and respiratory organs; and care must be taken not to mistake that secondary mucous inflammation of the bronchi, which at times arises from the frequent congestions which take place in their lining membrane from a variety of causes.

Bronchitis and Asthma.—Acute bronchitis and asthma are sometimes liable to be confounded; but the presence of inflammation in the former constitutes an essential distinction. The progress of the two diseases is likewise peculiarly contrasted by the absence, in bronchitis, of the sudden severity of dyspnœa, which, in asthma, comes on almost instantaneously. The character of the cough—the peculiar tickling sensation, which commonly precedes and is considered to be the cause of the cough—the appearance of the expectoration—the slow accession—as also the gradual subsidence of the catarrhal paroxysm, may serve to distinguish these two diseases. The reader is further referred to what has been said on the diagnosis of catarrh and asthma. In those spasmodic affections of the glottis, and larynx, which are occasionally confounded with asthma, the character of the sound emitted will at once contradistinguish them from asthma; and the patient, besides, is perfectly sensible of the seat of his uneasiness. In addition to this, he exhibits an alarm and sense of danger which the asthmatic rarely betrays.

Pulmonary Apoplexy and Asthma.—Pulmonary apoplexy and asthma have some features in common, but the line of demarcation is, nevertheless, distinctly marked. In both the dyspnœa is equally violent;

but in pulmonary apoplexy it is occasionally accompanied by acute irritation of the larynx, and by entire absence of sound in a greater or less portion of the chest, and sometimes by a bellows' sound, more or less distinctly audible in the heart and arteries, with a full, frequent, and vibratory pulse. Again, expectoration of sanguineous sputa quite pure, or intermixed merely with saliva, the result of the hæmoptysical engorgement, forms a leading symptom in this disease; whilst, although the same condition may accompany asthma when intense, it is chiefly towards the close of the fit, and is never considerable. The sound of the chest is seldom much altered on the first invasion of pulmonary apoplexy; but a well-marked change takes place in the murmur of respiration. However, the most peculiar and distinctive signs presented by the stethoscope, are the absence of the respiratory sound over a confined space, or spaces, around which is heard the crepitous rattle. The latter is ordinarily succeeded, as the disease gains ground, by the *mucous râle.*

A singular case is recorded by Hohnbaum, the subject of which, a man aged forty, and a free liver, had been an asthmatic patient, and died, (as dissection proved,) of pulmonary apoplexy.

Hydrothorax and Asthma.—Hydrothorax approximates, in some of its symptoms, to asthma, more especially by the violent suffocative fits which come on at night. Percussion and auscultation, however, will readily mark the difference: the former by its dead sound, and the latter by displaying the absence of the respiratory murmur.

Hysteria and Asthma.—The asthmatic attacks to which *hysterical women and hypochondriacs* are subject, may be distinguished from asthma chiefly by means of the form of the attack. This consists more in a certain degree of distress and in the sensation of constriction in the throat, and comes on at indeterminate hours, more especially in the day-time, whilst it is ordinarily combined at the same time with various other hysterical and hypochondriacal symptoms. The posture and demeanour of the patient will also assist. Now, though it would be wrong to confound such cases with real asthma, yet it is a certain fact that hysteria and hypochondriasis may prove the direct and principal occasion of genuine asthma, if they should only concur with other circumstances favouring the same result, among which may be reckoned a congested state of the portal system, which itself is often capable of counterfeiting spasmodic asthma.

Vesicular Emphysema and Asthma.—The last disorder I think it necessary to mention as likely to be confounded with asthma is the vesicular emphysema of Laennec. This may simulate asthma by the violence of the dyspnœa; but contrary to what happens in the latter, the dyspnœa is habitual, although subject to returns of exacerbation. The regularity of the pulse, too, in this species of emphysema, joined with the absence, or at least the obscurity of the stethoscopic signs, constitutes another marked difference.

Prognosis.—This is seldom difficult; doubt can arise only in cases severely complicated. When the asthma wears the purely nervous form, danger is rarely to be apprehended; yet, if long continued, it may give rise to organic alterations seriously affecting life. Abstractedly from this, and also from the considerations belonging to the age and habits of the individual, the prognosis, so far as the immediate safety of the patient is concerned, may be almost uniformly favourable.

From the nature of the causes, however, on which the disease depends, the prognosis must often vary. Asthma, proceeding from any intense moral affection, or from causes which acting on the bronchi merely disturb the respiration, will probably be but of short duration; yet, if it be violent at its onset, and is perpetuated by repeated attacks, each fit must aggravate the symptoms and increase the danger. Any dropsical swelling is an unfavourable circumstance, although Floyer seems to have regarded it otherwise. A superabundant secretion of a watery character, in consequence of filling up the bronchial tubes in the lower part of the chest, to such an extent as to prevent the free admission of atmospheric air, is sometimes, in old asthmatics, the cause of almost instantaneous death.

The occurrence of peripneumonia notha, as I shall have occasion to notice more particularly hereafter, in persons enfeebled by age or sickness, is an unfavourable symptom, and is indeed often attended with considerable hazard; and the danger arising from malformation is noticed in that aphorism of Hippocrates, which has proved so fertile a field for controversy, *Οκόσοι υβοὶ εξ ἅσθματος ἢ βηχὸς γίγνονται πρὸ τῆς ἥβης ἀπόλλυνται.* Lommius has a remark to the same effect.

It may be set down as an ulterior good, that when the asthmatic disease has once induced emphysema, the patient can never be assailed by that much more intractable malady, pulmonary consumption. The enlargement of the lungs that follows is a sure barrier against its inroads. I may observe that the same happy preventive against consumption is found in emphysema of the lungs, should cancer, or any incurable disease follow. The patient's life is prolonged by the security the emphysema affords against phthisis, which, but for it, would be likely to supervene on the deterioration of the general health occasioned by such diseases.

From the congestions which take place in the liver, and the other viscera connected with the vena portæ (the results of the pulmonary impediments produced by asthma), some structural disease of these parts, or effusion from their serous covering, is, at times, likely to occur.

The disturbance given to the central organ of circulation is frequently productive of dilatation, as well as hypertrophy, or some other change in it, or its valves. When such a complication, as well as hydrothorax, hydro-pericardium, or an œdematous state of the lungs, happens to supervene, which, however, is consequent on long continuance only of the asthmatic disease, the prognosis is rendered more doubtful. Indeed, it is seldom found that these partial dropsies occur without being followed by general dropsy, which state, when occasioned by visceral disorder, is highly dangerous. Asthma of long standing is apt, in some cases, to degenerate into habitual catarrh of one species or other; and when the catarrh is violent, and the patient of a full habit of body, apoplexy has come under my notice as the result.

It may be remarked that, under certain very favourable circumstances, idiopathic asthma admits of perfect cure. If the occasions of the disease happened to be merely accidental and transitory, or such as may be removed—as, for example, in the case of asthma from certain noxious vapours, in instances of asthma occasioned by metastasis of gout and certain cutaneous diseases—if the patients are in other respects healthy, if the disease has not yet become inveterate, or complicated with other serious and morbid states—if there exist no malformation of the chest, and no degeneration in the lungs—in such cases we may hope for recovery, or at least for an important alleviation of the disease.

A very remarkable, but hitherto unnoticed fact connected with the history of asthma, is an exemption, which I have frequently noticed, of asthmatics from aneurysmal disease. This originates in their non-liability to that scrofulous degeneracy of the blood vessels, on which aneurysm will, if I mistake not, be frequently found to depend. We know that the artery is nourished in the same manner as every other part of the body; and from its vascularity and organization, it must of course be liable to those accidents, to which every vascular and organized part is exposed. Now that state, which Scarpa has denominated the steatomatous condition of an artery, and in which the internal surface exhibits an irregular and somewhat fleshy appearance, and at other times that of small flattened tubercles, is identical, I have long had reason to believe, with strumous deposit. By the interposition of this substance, the middle and internal coats of the artery become at length so attenuated and absorbed, as to yield to the impulse of the circulation: laceration ensues, and thus the aneurysm is eventually formed. Again the steatomatous, or tuberculous deposit, undergoes precisely the same changes which we find take place in the lungs, or in the bronchial and other glands. When it softens down it becomes atheromatous or purulent matter, in every respect of the same nature as the pulpy or curdy consistence of the crude, or ripe tubercle. Still further, when absorption takes place, partial adhesion commences between the internal and middle coats; and where this is imperfect, a squamous and cretaceous formation is begun to supply the place left vacant by the absorbed matter, as we find in cases of imperfect cicatrisation of the lungs, or of strumous disorganisation in a bronchial gland.

To sum up the prognosis in few words, asthma is seldom productive of present danger, but often betokens much future inconvenience.

TREATMENT OF ASTHMA.

It has been frequently stated, that in order to administer medicines in the treatment of disease with any rational grounds of success, it is necessary for the practitioner to be acquainted with the nature and seat of the affection he has to treat. This statement is in strict conformity with the old medical adage, that the knowledge of a disease is one half its cure. Now, if this maxim be rigorously adhered to, and then applied to asthma, it will at once appear, from what we have just said of the obscurity in which the pathology of this affection is involved, how cheerless must be the prospect of a medical man when called on to treat a case of asthma. The truth of this adage, however, as a general principle, is more than questionable; I fear the same thing may be said of almost all general principles applied to the healing art. It should be remembered, that all our knowledge of the treatment of those disorders to which man is obnoxious, is originally obtained from observation;—observation, I mean, not of the seat and *nature* of diseases (for these are without its precincts), but of the *effects* of remedies. Our knowledge of therapeutics is, in fact, decidedly empirical. However humiliating such an admission may seem to the scientific pathologist, truth obliges us to confess that the most successful treatment of disease has but little reference to the morbid state of the organ, or organs, which may be affected in it. It certainly is not necessary to know the intimate nature of a disease in order to be satisfied that the disturbances of the innervation, whatever be its seat, have a considerable share in the production of the effects or symptoms. In considering the treatment, we shall follow nearly the same order as that adopted by Willis—one of the oldest, and, for his time, one of the best writers on asthma—to whose work on the subject allusion has already been made in the course of this treatise. In the treatment of asthma, two primary or leading indications present themselves—viz., the Curative and Preservative. The former points out what is to be done during the paroxysm, so as to free the patient from present danger; whilst the latter suggests the means to be adopted for the removal of the morbific cause of the affection, and for preventing the recurrence of the paroxysms.

Extensively engaged as I have been for a series of years in investigating diseases of the chest, and enjoying the opportunities afforded by the situation of senior physician to an infirmary expressly devoted to this class of complaints, I have witnessed but a very small number of cases of what I would strictly call pure asthma.

The first circumstance to be considered in the treatment of this disease is the exciting cause, and next the organic complications with which it may be allied. When purely nervous, its treatment will be influenced by differences of age and sex; its mental or physical origin; the place of residence, as well as the constitution of the patient, with numerous other minutiæ to which the attention should be especially directed. Generally speaking, as some form of spasmodic irritation is always present, the removal of this will be a primary object.

The subject of the treatment should be considered in this disease in a twofold point of view, as I have stated, viz., that necessary to be employed during the existence of the paroxysm, and that to be adopted during the intermission. It may be observed, in conformity with this principle, that the commencement of the fit should be sedulously watched and vigorously grappled with. Perhaps the form of this disease most difficult to treat is that in which it is hereditary, and, as it were, congenital. When the patient is aware from previous experience, that an attack of asthma is on the eve of seizing him, or when he is already seized, I have found the exhibition of a mustard emetic produce the most satisfactory effects. From a tea to a dessert-spoonful of mustard should be mixed with a quart or three pints of warm water, and a tea-cup full should be taken at intervals until the wished for effect be excited. The sickness will be found to remove the distressing constriction of the chest, and to dissipate that flatulency and sense of fulness, from which so much inconvenience is experienced.

A patient of mine, who suffered from nervous asthma in the West Indies only, assured me that he almost always experienced this simple remedy to be effectual.

It is expedient, when there exists much acidity in the stomach, and the eructations are troublesome, to combine with the mustard a tea-spoonful of calcined magnesia, or of prepared chalk. Whenever I have found an objection on the part of the patient to the mustard emetic, I have substituted in its place twenty grains of ipecacuan with half a grain of tartarized antimony; this, indeed, I in general prefer to the former, although I have seen instances in which the mustard emetic has proved singularly efficacious in arresting the precursory symptoms, or relieving those of the paroxysm when actually present.

The observation I would make for the purpose of directing the practitioner in making the selection is, that in cases of periodic asthma the mustard emetic will exert the most favourable influence; and that when the attack has been suddenly induced by cold, or over indulgence with respect to food, the ipecacuan is the more appropriate and successful. The simple sensation of nausea will often prove no less advantageous than actual vomiting, which operates by determining to the surface, and effecting a change in the seat of the convulsive action; whilst, by inducing nausea, this action is lessened through the decrease and relaxation of the living power. In the absence of every sign indicative of inflammation, I have been led to try sulphate of zinc and other emetics, but I consider these as inferior to the formulæ just mentioned. It is, however, advisable to avoid the too frequent repetition of medicines of this class, since they are apt to lose their effect when too often repeated. They are also to be avoided in patients of a full habit, or who exhibit any tendency to a determination of blood to the head.

With respect to the use of emetics in asthma, there are, according to some practitioners, two periods when medicines of this class may be prescribed with advantage,—1st. immediately before the advent of the fit, and 2nd. during the intermission. In the former case they have been found effectual in preventing the attack altogether. When emetics are prescribed during the intermission, it is for the purpose of repairing those injuries or removing those disturbances which any of the important viscera, whether of the chest or abdomen, may have suffered during and in consequence of the violence of the paroxysm. The principal disturbances likely to occur in such circumstances are congestion of the bronchial membrane, as well as obstruction of this membrane by mucus, and also a congested state of the liver and entire biliary system: the admitted power of emetics in removing these states must strongly recommend their employment in asthma. Should the asthmatic paroxysm arise from repletion of the stomach, or from the use of improper meat or drink, Dr. Kreyssig of Dresden recommends the employment of a mild emetic of ipecacuan.

A few years ago, a very interesting case of periodic asthma was presented to me in the person of a patient who had been in the first instance an asthmatic subject, and had afterwards contracted ague. It appeared, by his shewing, that he had suffered two or three paroxysms of convulsive asthma, and subsequently to the last attack had passed a year without experiencing any recurrence of the complaint. At the expiration of this period, he had occasion to go for some time to the lower part of the county of Essex, and thence returned to London. About three months after his return, he caught some slight complaint which affected his general health; and on this the symptoms of intermittent fever (the seeds of which were doubtless laid during his residence in Essex,) manifested themselves. At the time he first consulted me he had got rid of the ague, the asthma had returned, and about every fortnight he was seized with an attack, which, ushered in with all the symptoms of the cold stage of an intermittent, regularly terminated in convulsive asthma. It was after experiencing several of these attacks that he applied to me; and I recommended him, as I usually do in ague uncomplicated with visceral disease, to take, on his next seizure, a draught containing five-and-twenty drops of laudanum; and, if no relief followed, another draught containing five drops less. For the second dose, however, there was no occasion; and on the manifestation of another attack about a month afterwards, this prescription proved equally successful in averting the threatened paroxysm. It is necessary to add, that a few hours after the exhibition of the opiate, he was directed to take a grain of sulphate of quinine every four hours, which was to be continued for three or four days. When the threatenings of the second attack were averted by a similar course, fearing that some visceral congestion might exist, I ordered him to take a grain of calomel, combined with extract of gentian, night and morning for a week. Some months afterwards I lost sight of him; but up to this time he enjoyed uninterrupted good health.

From the variable nature of the pure asthma, as of all nervous complaints, no one remedy is applicable in every case, or indeed in the majority of cases. What will prove effectual with one individual, will be entirely inefficient with another. It is with the nervous affections of the body as with those of the mind, however similar to all appearance the disorders, mental or corporeal, of different persons may be, the medicines which will succeed in one instance will fail, or even aggravate, in another. Thus, when I have found none of the above remedies beneficial, I have resorted with success to an infusion of tobacco, consisting of ten grains or more of the common leaf to a pint of water, to be used in the form of an injection. Though purging is, generally speaking, not to be recommended, especially when the lungs of the patient happen to be voluminous, (which is usually the case in asthma of long standing,) yet otherwise at the commencement of an attack of the purely nervous kind, I have obtained the most beneficial results from the exhibition of calomel, combined with some aloetic pill. Wherever there is reason to apprehend the existence of constipation, or some indigested aliment in the first passages, such a course is highly advisable.

At my outset in practice I fell into an error then common in the medical world; and, aware that diseases of the chest were frequently connected with dyspepsia, I accordingly used to purge my asthmatic patients, until experience and a little reflection on the pathological characters of the disease taught me better. I was not long, indeed, in discovering that after a series of attacks the lungs become enlarged; and having once established this fact, it was evident that to purge would, by allowing too great freedom to the diaphragm, increase the difficulty of respiration, since the lungs are already preternaturally enlarged.

From the time of Willis, who lays down as a rule, "The greatest care should be taken judiciously to combine antispasmodic medicines," anti-spasmodics have been very generally used, but I have not found any great benefit derivable from them. The most efficacious mode of using them, however, is in the form of injections. Half an ounce of oil of turpentine, or more, combined with the yolk of an egg, and mixed with barley-water so as to form a six or eight ounce enema, or else the assafœtida mixture, to which a grain of acetate of morphine may be added, may be advantageously employed in some cases. Exhibited in this form, they are less likely to prove injurious as stimulants than when taken as a draught; and, when not at first efficacious, they may be repeated after an interval of half an hour.

The asthma is so rarely of a purely nervous nature, that too much caution cannot be used in the administration of these medicines; since, when it happens to be complicated with any bronchial affection, their stimulating properties may do more harm by the excitement of inflammatory action than their operation as sedatives can do good. The principal antispasmodics which may be employed are musk, castor, cardamine, gum ammoniac, the æthers, assafœtida, camphor, and valerian. These may be, at times, beneficially combined with nitrate of potash, ipecacuan, and articles of the narcotic class, as lactucarium, hyoscyamus, conium, &c. Compound spirit of lavender, and spirit of aniseed, with a few drops of laudanum, have, in some cases which have come under my care, produced the most desirable results. Since the disease, when it has once manifested itself, is not unfrequently reproduced by cold, the bathing of the feet in warm water, and using warm demulcent drinks, will, at times, assist in arresting the aggression of the paroxysm.

Floyer states, "I know an asthmatic who, upon any tendency towards a fit, drinks plentifully of milk and water, which presently allays the inflation of his stomach."

I might enlarge upon this branch of my subject by enumerating many substances and various forms of medicine, which my patients have assured me they have found productive of relief; but so uncertain is the treatment of this, the pure form, and so much depends on the fancy as well as the constitutional habit of the patient, that I might fill a volume with similar details. Sufficient has been said to indicate the more generally applicable and salutary modes of treating the disease in its precursory stage; and I now proceed to consider the means to be adopted during the presence of the paroxysm.

First upon the list of the measures prescribed by most writers on the subject, we find blood-letting, which, however, requires nice discrimination and much experience to direct its application. Floyer observes, (and, from his personal knowledge of this afflicting complaint, his remarks are well entitled to attention,) that bleeding will never cure the patient, although it may do much to alleviate the straightness and suffocative feeling of the chest. The young, too, he very justly says, derive more benefit from it than the old; who, he adds, "after some time become cachectic." This opinion seems tantamount to that of Cullen, who confesses that its employment cannot be continued without weakening the constitution, and sowing the seeds of dropsy.

Dr. Bree, who was led into many errors of importance by too great an inclination to theorize, states, that of the four species into which he has divided asthma, there is only one—his second form—in which it is advisable; that, namely, which he regards as arising from irritation of aerial acrimony in the lungs. In his first species, which he considers as the result of irritation from effused serum in the lungs; in his third, that from irritation in the stomach, or some of the abdominal viscera; and lastly, in that dependent upon habit, he pronounces bleeding to be inadmissible.

Now, auscultation being unknown at the time he wrote, I do not exactly see how he could have discovered the effusion of serum, as an exciting cause, antecedent to the asthmatic fit. The presence of serum, in several of the examinations after death transcribed by the doctor from other authors, indicates an œdematous state of the lungs, which may occasionally be complicated with asthma, but is by no means its cause. Indeed, an œdematous state of the lungs, which both Doctors Baillie and Blackall consider of unusual occurrence, is, on the contrary, very frequently seen on dissection. Scarcely an individual dies of chronic disease, with swelled extremities, whose lungs are not more or less œdematous. I fear the first gentleman derived what he knew of morbid anatomy from inspecting the museum of his uncle, Dr. Hunter, rather than from observations made on the human body: a bad method to be pursued by one who has been cried up as the greatest morbid anatomist our country has produced, but one admirably well calculated to account for his ignorance of that anasarcous condition so generally recognised by the practical pathologist.

With respect to Dr. Bree's third and fourth species, there can be no reason why recourse should not be had to bleeding, when the difficulty of breathing amounts to a suffocative state, when the patient is plethoric, or as a precautionary step against any evil to be apprehended to other parts from visceral hyperæmia, or from any impediments offered by the severity of the paroxysm to the circulation through the lungs. The state of the system for which venesection is most likely to prove serviceable is indicated by turgescence of the veins of the neck, attended with intense headach, coma, lividness of the lips, and eminences of the cheeks, of the nose, &c., by laborious action of the heart, and by respiration anxious, painful, and at times almost suspended.

Generally speaking, the wish of the patient, if he be an old asthmatic, and has consequently had experience as to the measures which afford him relief, is no unsafe guide on the question of bleeding, and ought to have due weight with the physician; and it should likewise be taken into the account, that depletion acts as an anti-spasmodic.

Dr. Bree has asserted, that in humid asthma he never saw the paroxysm shortened an hour by the use of blood-letting, but is convinced that delay to the expectoration, and increased dyspnœa in the intermission, result from this practice: excepting the state just described is manifested, he is partly in the right, although his assertions are much too sweeping. In many instances of humid asthma, I have known considerable benefit obtained through the abstraction of blood from the arm; and, indeed, in all the varieties of asthma, local bleeding by leeches to the chest, and especially to the trachea, will frequently be productive of the happiest effects. If the patient is cachectic, suffering under abundant pituitous secretion, and his complaint approximates to well-marked peripneumonia notha (the disease so called, but imperfectly described by Sydenham), or, what I may not be incorrect in terming bronchitis asthenica, then bleeding to any extent is undoubtedly improper. To local depletion by means of leeches, in all pectoral complaints, I may repeat, I am decidedly favourable. In those cases in which there is insufficient secretion, the discharge is promoted by it; and when excessive, the irritation, which excites the mucous glands, and exhalants, to inordinate secretion, is soothed. Yet, I must subjoin as a precaution, that the experienced auscultator will never prescribe bleeding, either generally or locally, when he discovers the existence of an œdematous state of the lungs; which condition is not unfrequently met with in humid asthma, and sometimes occurs after a severe and protracted paroxysm of dry asthma, in a habit previously debilitated. It may be taken as a general rule, that there is less danger to be apprehended from bleeding in the summer than in the winter season. Dr. Kreyssig remarks that should the occasional cause be suppressed hemorrhoids or catamenia, or the suspension of other habitual sanguineous discharges, bleeding with leeches, or even general bleeding will be attended with decided advantage.

A practice which I have found attended with considerable success, is to apply leeches to the chest a short time after the subsidence of a paroxysm; or at any time in the intermission, slight dyspnœa still continuing. So long has been the intermission frequently procured by this simple plan, that I have had many patients, and amongst them some formerly under Dr. Bree's care, who, from the long respite they enjoyed after this practice, imagined themselves cured. The incorrectness of the statement I have seen with no slight astonishment put forth, in a recent medical work, that in the paroxysms of asthma bleeding with leeches is improper, may be estimated from what has gone before.

The blood taken from asthmatics occasionally exhibits the buffy crassamentum indicative of inflammation; and in the case of a noble lady, a former patient of Dr. Bree's, to whom I was called in when she was labouring under a violent paroxysm, I found this inflammatory state evidenced, in a remarkable degree on depletion, as I suspected it would be. Whilst on this subject, I may notice, as a singular fact hitherto, so far as my knowledge extends, unnoticed, that when the lungs are very voluminous, as they commonly are in asthmatics of long standing, the patient seldom suffers from pleuritic attacks. The finest specimens we possess of lungs unaffected with pleurisy have been taken from individuals who come under this description: even in the case of consumptive patients, whose phthisical complaint has been cured by the supervention of asthma, if we except adhesion at the summits of the lungs, the result of pleurisy antecedent to this supervention, we do not often find evidences of its subsequent aggression.

Mercurials.—There are few cases of pure asthma which, at times, will not be benefited by the exhibition of mercury, under some form or other. Mercurials may be truly said to possess a multitudinous power. If taken early, they moderate and abridge the severity of the fit; and when employed in a later stage, they are powerful assistants in removing the congestion, both pulmonary and abdominal, the never-failing consequence of an asthmatic attack. Where expectoration is deficient, they act on the whole glandular system of the lungs, removing likewise vascular congestions, and any aqueous effusion in the lungs, or elsewhere.

The influential range embraced by mercurial preparations will be readily understood, when it is considered that mercury operates at once both on the secerning, and the absorbing system. To the anatomist and pathologist, who must be aware of the state of congestion and obstruction in which a patient is left on the subsidence of an asthmatic paroxysm, the administration of mercury at this period will require no reasoning to support it. But for the guidance of the young practitioner, and the satisfaction of those asthmatics who may peruse the work, I deem it expedient to enter rather minutely into the ground-work of this practice.

In the first instance, mercury acts as a general stimulant, and by determining to the surface, tends to equalise the circulation all over the body; the necessity of which is manifested by the coldness of the extremities, and other symptoms of insufficient circulatory powers. The organ most susceptible of the influence of this mineral is the liver. By its action on this viscus, it restores its secretions to a healthy state, relieving that congested condition dependent on the obstruction resulting from an asthmatic attack. The healthy impression is extended to all the chylopoietic viscera, and, in fact, to every part influenced by the circulation through the liver; and thus the patient is freed from that train of nervous anxieties, and the irritability of temper, which the ancients seem to have constantly referred, with no little medical propriety, to the "splendida bilis." This querulous and peevish condition of the asthmatic, while the fit is on him, has been already noticed.

It has been long observed, that after a fit the urine becomes somewhat scanty and high-coloured; but this is immediately altered on taking a little calomel, which, acting on the kidneys, operates as a diuretic. The congested condition of the kidneys is referrible to that of the great venous trunks—the superior and inferior vena cava; and freedom given to the obstructed circulatory system in the one part, will eventually remove obstruction in the other.

As we find, too, that the nervous asthma is generally accompanied towards the termination of an attack by a kind of crisis, when expectoration comes on, the administration of mercury promotes the discharge of the secretion, and appears to afford relief to that congested state of the mucous membrane whence the discharge arises. In general, when the fit is severe, I prescribe two grains of calomel, combined with a grain of ipecacuan, or squill, and order this to be repeated every hour, or every second or third hour, until the patient has taken two or three doses, or even more, according to the emergency of the case. I have found this plan eminently successful in shortening the duration of the attack, abbreviating the period of convalescence, as also in placing the patient in a favourable condition for the abstraction of blood, in those cases where it may be necessary.

From what I have already stated of the action of mercurial agents, as stimulants, it may be inferred that they are also anti-spasmodics; and in addition, as we have seen, they are likewise deobstruent. Their powers are, in fact, of a very wide description; and, judiciously employed in asthmatic cases, guarding especially against subjecting the patient to their too powerful operation, there is no class of medicines of a more universally useful character. I would wish it to be distinctly understood, that they are not to be resorted to on every trivial occasion; and, in many cases, the milder forms, as the pil. hydrargyri, or hydrargyrum cum cretâ, are to be preferred.

In one of the severest cases of convulsive asthma that ever came under my notice, occurring in the person of Lady ——, the wife of a general officer of noble rank, the most marked success was experienced from their prompt use. On being called in, I found her labouring under the influence of a paroxysm, which had continued for two days. From her excessive debility, bleeding was out of the question, and even the application of leeches seemed to be of questionable propriety. I immediately ordered a dose of calomel, to be repeated in the manner above described, and had bladders of warm water applied to the back, over the course of the sympathetic nerves. The result was the speediest recovery the lady had ever enjoyed.

I have already mentioned that it is a favourite practice with me to order the application of leeches on the incipient decline of the paroxysm, in order to remove every symptom of congestion; and, from similar views, I often prescribe a grain of calomel morning and evening, to the number of four or five doses. So beneficial has been this course, that several patients have attributed their cure to its efficacy. The sooner the morbid condition is removed, and the return to health accelerated, the less likely is the disease to become habitual. When the cure is left for completion to the gradual interposition of nature, that asthmatic diathesis is confirmed which a little vigour in the treatment would have effectually averted.

It is of the first importance to attend to the effects caused by the asthmatic paroxysm; hence the soothing treatment, by means of leeches and mercurials, which is advocated above. By removing speedily and effectually the slight dyspnœa, which an accurate observer will detect for some time after the subsidence of the fit, as well as that gastro-enteric hyperæmia which always takes place, and by thus counteracting the disturbance of the digestive functions, the spasmodic character of the disease, if this plan be rigidly adhered to in the intermissions, will at length exhaust itself. It is only by thus watching and timely checking whatever tends to create irritation or congestion of the air-passages, before it has time to excite any undue susceptibility of external impressions, that the physician can hope to conquer the asthmatic habit. Nor is it the least advantageous part of this treatment, that by thus early restoring the patient to a healthy physical state, the mind will participate in the soundness of function; and the subduing of the morbid sensibility, to which the patient is prone in this form of asthma, is a point of primary importance.

Diuretics.—From the earliest times the use of this class of medicines in asthma has been warmly recommended by many medical writers. Passing over the opinions of the ancients, and coming to writings of more modern date, we find Hoffman thus expressing himself: "Diuretics are found very serviceable in that cachectic state which is co-existent with asthma."

On several occasions I have administered with decided advantage the following formula, with the view of exciting the kidneys, and at the same time of allaying irritability:

℞. Aquæ Cinnamomi ʒvj; Infusi Digitalis ʒij; Potassæ Nitratis ℈i; Magnesiæ Calcin. gr. x; Syrupi Tolutani ʒiss; Tinct. Scillæ ♏x;—M. Fiat Haustus.

The first two doses may be taken with the interval of an hour between them; and the dose may then be repeated every four or six hours, until an evident abatement of the symptoms is manifested. In other instances, a prescription of the following nature may be employed, both as a diuretic and a febrifuge. The mode and intervals of administering it are similar to those of the foregoing recipe.

℞ Liq. Ammoniæ Acetatis ℥ss; Potassæ Carbonatis ℈iss; Acidi Acetici Diluti, Q. S. ad saturandum; Oxymellis Scillæ ʒiss; Spirit. Æther Nitrici ʒss. M.
Ft. Haustus Diureticus.

When the patient's habit is cachectic, and there is any reason to be apprehensive of hydropic symptoms, the digitalis is especially to be recommended. It may be continued with advantage, but with caution, after the subsidence of the fit. I have found it agree best in asthma with individuals of a delicate habit; and, as a corollary to this, I have observed it to be more consonant to female cases than to those of males. Withering, who introduced the use of foxglove as a diuretic in 1775, appears to have made observations similar to mine with respect to its effects. He remarks, that its use seems most beneficial in constitutions whose weakness is indicated by paleness of the countenance, lax state of the fibres, and a feeble intermitting pulse. Floyer states, that swelled legs and a copious discharge of urine are favourable changes in asthma; I agree with him as to the latter, but much doubt his accuracy in the former. In addition to the above remarks on the use of the digitalis, it should be borne in mind that if, after the termination of a fit, an œdematous state of the lungs is observable, diuretics are especially indicated; and, in such cases, a small mustard cataplasm applied on each side of the chest, will be productive of speedy absorption. As it will happen in some cases that one lung only will be œdematous, the experienced auscultator will, of course, apply the sinapism over that part of the thorax alone. Dr. Bree seems to regard digitalis as a medicine of very little efficacy; this opinion, it is not improbable, arose from his having employed it during the existence of some inflammatory bronchial affection, or at some other unfavourable juncture. As he omits the form in which he prescribed it, it is not unreasonable to conclude that he did not use the infusion, which is unquestionably the most diuretic preparation under which the leaves of this plant can be exhibited.

Nitre, which is one of the ingredients of the first prescription I have given, is a diuretic of considerable utility, and appears to have been highly esteemed in former times. Avicenna observes, that nitre cleanses much, and is given in "a decoction of rue and dill." Many other diuretics might be enumerated; but as they differ merely in their greater or less power of promoting the urinary flux, I may conclude my observations on this description of medicines in the words of Celsus: "all medicines are useful which promote the urinary discharge."

Narcotics.—The most powerful remedies employed in the treatment of asthma are those whose action is directed to the nervous system. The chief of these belong to the class of narcotics. Their action seems to extend not merely to the nervous centres, but also to the nerves of the respiratory organs. It is supposed that in asthma they moderate the accumulation of the nervous fluid, and produce a change in the mode of innervation. The majority of practitioners refer their beneficial effects to their sedative influence. We shall see presently that Laennec explains this mode of action somewhat differently. The discredit which has been thrown on this order of remedies is easily accounted for; they have been used without discriminating the various forms and states of asthma. The young practitioner especially, arguing from the violent spasm, its frequent accompaniment, flies at once to agents he believes so strongly indicated, and is often surprised to find the complaint irritated instead of relieved. Were the common asthma of the pure form, no remedies would prove more beneficial; but asthma being, for the most part, a complicated disorder, and this too with some tracheal or bronchial irritation, narcotics will too often in such instances tend to stimulate and excite rather than allay. Here, then, we may draw a line of distinction, which will prove a safe guide in practice. It is indeed very difficult to meet with junctures favourable to their exhibition; and I have little doubt many medical men may pass through the better part of their lives and practice without meeting with many such cases.

At the beginning of the complaint, when it first manifests itself before the violent paroxysm occurs, or before there is any turgescent state of the mucous membrane, narcotics judiciously exhibited might be productive of much advantage; but, at this early stage, the physician has seldom the opportunity of acting. In cases of longer standing, too, I am inclined to believe that there are some rare occasions on which they might be employed with benefit; however, the old asthmatic, if they are likely to prove serviceable, will be aware from his own feelings when and how to resort to them. Still, both patient and physician cannot be over-cautious in often recurring to them; and, generally speaking, in every catarrhal complication of asthma their habitual use cannot be too strongly reprobated.

I think it necessary to add that, previously to their exhibition, it is essential to lessen whatever venous congestion may exist, and then to have recourse to these auxiliaries for that strangling constriction of the chest, whose usual consecutive is congestion; and, as I believe narcotics to be directly sedative, I would have the dose, when they are given, proportioned accordingly. I need hardly point out that the agent to be employed for the abatement of congestion is venesection, to the extent of from eight to ten ounces.

Dr. Forbes of Edinburgh first, I believe, introduced the practice of administering the acetate of lead in convulsive cough, in a treatise, "De tussi convulsiva," published by him in 1743, and I have found it very efficacious when combined with acetate of morphine, in the following proportion: three grains of acetate of lead, with a quarter of a grain of acetate of morphine, conveyed in an ounce of distilled water, with some simple syrup. In some instances, I have administered from four to five minims of the diluted hydrocyanic acid in an ounce of almond emulsion. Each of these forms of medicine may be repeated at intervals of a quarter or half-an-hour, as far as two or three doses; or, if it be found necessary to repeat them more frequently, the periods between each dose should be considerably lengthened. Besides these, the other narcotics in general use in asthma are various preparations of opium, hyoscyamus, belladonna, aconitum napellus, cicuta, colchicum, lobelia inflata, stramonium, &c.

With respect to the use of narcotics, Laennec has started a theory which, to say the least of it, is highly ingenious. He supposes that narcotics lessen the necessity of respiration, and that by thus assimilating the condition of the patient to that of hybernating animals, which when torpid consume a hundred times less air than when in a state of activity, these medicines afford relief and freedom from dyspnœa. He strengthens this supposition by the fact that during sleep asthmatics enjoy cessation from the feeling of oppression. Laennec's theory on this matter seems to be this: that narcotics, by diminishing the necessity of respiration, prevent or retard the recurrence of the asthmatic fits, which are but exaggerations of this necessity. M. Edwards has proved by experiment that the respiratory function is not equally intense at all periods of life; that there are in this respect striking dissimilarities at different ages, and in different individuals. Accordingly, if the mode of breathing be not the same for all, the necessity for this act cannot be the same for all. Laennec's theory with respect to the *modus operandi* of narcotics in diminishing the necessity of breathing appears to receive some support from that which takes place in persons affected with hypertrophy, or other disease of the heart, to whom opium is given to induce sleep: the effect of this is, that they awake in great distress. In this case, the action of the narcotic is supposed to diminish the necessity of respiration; but the power of the circulation being still unimpaired, or nearly so, the blood still flows into the lung, and can no longer absorb sufficient oxygen, whence the momentary asphyxia into which the patient falls. Without entering into the merits of this theory, I may subjoin that I conceive narcotics to act on the sensorium, diminishing its sensibility, and thus extending their influence to the whole nervous system.

The last of this species of medicines which I have enumerated deserves a separate notice from the celebrity it once obtained. Like most other medicines possessing any active power, stramonium was lauded to the skies when first introduced, and has now fallen into disuse and neglect, equally as undeserved as the exaggerated praises it once received. Previously to any trials of its virtues in asthma, it had been introduced by Stoerk as a remedy in convulsive affections, epilepsy, mania, &c.; and as has been the case with its agency in asthma, some physicians found it successful and others the contrary; indeed, in all complaints which branch into a variety of species and stages, this must ever happen.

No single medicine will meet every fluctuation and varying state of the same disease; and supposing every symptom of the disorder in any two individuals to be precisely similar, yet a difference of constitution will cause the same remedy, and the same form of the remedy, to produce different results.

The business of the physician is, to distinguish the modification which one and the same complaint will exhibit, and to ascribe no inherent power to any medicine of operating uniformly in every case. A little attention to these distinctions would tend to remove that contrariety of opinion which medical writers display on the subject of narcotics in this disease.

Willis long ago pointed out a distinction of primary importance in their employment; that, in fact, unless contra-indicated by pulmonary infarction, and great oppression in the region of the præcordia, opiates are sometimes of signal service; and a little further he reiterates this caution in forcible terms, observing, that they must be administered with the greatest care, since they impede the respiration, which is already oppressed, and will at all times endanger life.

Taking this caution as a clue by which to guide his practice, the physician will walk safely through the labyrinth of conflicting testimonies, whether relating to stramonium or any other remedy of the class. Had the conclusions to be drawn from the plain and sensible distinction of Willis been attended to, and the inferences to be deduced from it through the various branches of medical science been carefully drawn, that hackneyed reproach of medical science, disagreement among the doctors, which indeed has become proverbial, would no longer be as applicable to our profession at the present day as candour obliges us to acknowledge that it was in days of yore.

As I am on the subject of stramonium, I may as well refer to it for a fuller illustration of my meaning. Supposing three patients to be similarly affected with asthma of the same species, under the same stage of the paroxysm, the results may be different in all three, from their mode of smoking alone: one may eject the smoke, another swallow it, and the third retain both smoke and saliva. The effects on the three, putting every other distinction, as that of constitution or age, out of the question, will, it is probable, be entirely opposed, and a different character be awarded to the unoffending herb accordingly.

As far as my experience goes, the use of opiates should be for the most part confined to those cases in which the intermissions are of some length; and I have found them useful when given on the approach of the fit, in young asthmatics especially. When judiciously varied, and adapted to the peculiar circumstances of the case and idiosyncrasies of the patient, they may at times be administered with a good effect.

What I have just said of opiates in general may be applied to stramonium in particular. The duration of the disease, that is, whether the patient be a young or old asthmatic, his constitution, the species of asthma, and the precise stage of that species, together with the mode of administration, will make the stramonium a medicine of great or of no efficacy. Whatever promotes expectoration will, of course, forward the solution of an asthmatic fit, and so far stramonium may be said to possess no greater virtue than tobacco; but, superadded to this, its narcotic powers are greater. It tends, when inhaled like its associate the "fragrant weed," or in plain language when smoked, to bring about that grateful forgetfulness of care, and balmy oblivion of the world, to which the inveterate smoker flies as a refuge from trouble, or excites that calm and meditative turn of thought which the studious of former days were accustomed to seek through the medium of the pipe.

Independently of these effects, I am induced to believe that the slight degree of nausea it is apt to superinduce is often beneficial; and its mode of action in accelerating expectoration is not improbably, by continuous sympathy, conveyed from the salivary glands of the mouth, and the small glands of the mucous membrane of the same part, to the bronchial tubes. The vertigo, too, as well as the drowsiness, often felt after its use, indicate its power over the nervous system.

Dr. Bree has given an account of a trial he made on himself of the effects of opium, which countenances what I have already advanced respecting the necessity of attending to the distinctions laid down by Willis, and inferences to be drawn from them. The doctor states, that he took four grains of solid opium in the access of a paroxysm of his first species, namely, that which he makes to arise from the irritation of effused serum. The consequences were what might have been expected, increased exacerbation, and every symptom exasperated. Had he paid more attention to the precise state of his case, examined its nature, and reflected that there could be no effusion of serum present without some affection of the mucous membrane of the bronchi, he would have been spared all the trouble and pain of experimenting to discover results which a little exercise of his reason might have anticipated.

From the detail he gives of the effects of the opium, and from the account he has penned of his own case, I am inclined to believe that he laboured under some form of catarrh. It is not at all improbable, from the dyspeptic symptoms he mentions, and coupling these with the affection of the chest which he seems to have had subsequently, that he laboured originally under latent phthisis, of which the indigestion was a secondary symptom. Auscultation being then unknown, such a conclusion seems perfectly warrantable. As a case in point, I may mention that some years ago the nephew of a well-known judge waited upon me, to ask my opinion respecting a convulsive asthma, from which he was a great sufferer; and, above all, desirous to ascertain what he might substitute during the paroxysm for the quantity of brandy, oftentimes amounting to above a quart, which he was, in the course of an hour, in the habit of taking to lull the spasm. His earlier symptoms, on inquiry, were very similar to those described by Dr. Bree, and he particularly stated that the complaint had its origin in dyspepsia. On exploration of the chest, I discovered the existence of a cavity in the summit of the right lung. Many instances of a like nature have occurred to me; and, had Dr. Bree delineated the early stages of his disorder as distinctly as the latter, I have no doubt it would be found that his asthma supervened upon latent consumption. Thus he gives no account of the symptoms preceding the dyspepsia, which would have indicated at once the origin of his complaint. But it is evident that some ailment of the chest was early at work, from his alluding to pain of the intercostal muscles, which could hardly have existed otherwise, or the reverse might have happened, and the dyspepsia impairing his health have thus indirectly led to the pulmonary affection.

Some remarks of Laennec coincide wonderfully with this view of the case. He observes, "that nervous symptoms may mask phthisis for a considerable period; and that he has known it concealed for years by habitual dyspepsia, and other symptoms of hypochondriasis." (*See New Transl. of Laennec*, p. 334, an. 1846.)

This, in fact, is giving in other words the commencement of Dr. Bree's case, as stated by himself. So strongly indeed am I convinced that one or other of these explanations will apply to the learned physician's case, and elucidate what has been omitted by him, that could he be induced to summon up his recollections, and retrace minutely the precursory symptoms of his disease, it would, I have little doubt, appear that either before or during his dyspeptic condition he had had attacks, slight ones perhaps, of hæmoptysis. However, for an author to retrace his steps, cross-examine himself, and confess his views to be erroneous, would be an effort of candour above the powers of poor humanity!

I would not be supposed to insinuate that any thing was purposely omitted by him. On the contrary, I believe he has detailed, and fully too, every symptom he conceived to be of importance; and that, supposing he had had slight spitting of blood, perspirations, or other symptoms of consumption, he would have considered any allusion to them out of place when on the subject of asthma. The course, therefore, of his complaint, on the supposition of the correctness of the views above taken, would be that on the appearance of the dry form of asthma, which did not exhibit itself for several years after the first manifestation of dyspnœa, his lungs became emphysematous, and the cavity, which I conjecture to have previously existed, was gradually closed. The care he appears subsequently to have taken of himself put a stop to the bronchial affection, and with it to the asthma, which at one period seems to have been habitual with him.

Heberden observes, and it is strictly applicable to the case under consideration, "Some few constitutions have of themselves either outgrown, or assisted by some judicious method of cure, have entirely conquered the asthma."

Anti-spasmodics.—Sulphuric æther, as well as the compound sulphuric æther known as the anodyne mixture of Hoffman, although both narcotics, yet since their anti-spasmodic properties are more distinctly marked, are perhaps more in place under the present class of medicines than under that of the former.

A fluid drachm of either of these substances may be given in some camphor mixture, or liquor ammoniæ acetatis, in conjunction with a small quantity of syrup of poppies; and this draught may be repeated two or three times at short intervals. During the presence of a fit, if it could be administered with convenience to the patient, an enema containing assafœtida, or spirits of turpentine, may be used with no inconsiderable benefit.

Having on several occasions witnessed the powerful effects produced by musk, I have at times ordered it in very violent paroxysms, and have seldom seen it fail of mitigating their severity. An advantageous form of exhibition is a dose of from twenty to thirty grains, suspended in half an ounce of mucilage of acacia, added to double this quantity of the infusion of valerian: this may be repeated after the interval of an hour. It is to be regretted that this drug bears so high a price as to subject it to adulteration. I coincide with the opinion expressed by Dr. Cullen, that it is one of the most powerful anti-spasmodics hitherto known.

The general rules I have laid down for the use of narcotics may be taken as the expression of my opinion on the employment of anti-spasmodics also. They assimilate so much in their nature, that the practice in the one may be safely followed in the other. I have pointed out the necessity of great caution and discrimination in their employment, and indicated the stages wherein they will be found most beneficial. It may not, however, be uninteresting to hear what Sir John Floyer says of them, in the strange phraseology of his time: there is much good sense in his observations, which are tinged of course with the exploded doctrines of the medical school of the day. "If castor, amber, assafœtida, volatile salts, or sulphurs, be taken inwardly, they rarefy the spirits, raise the effervescence, and drive the windy spirits into the nerves, whereby the strangulation is increased, by which experience I find, &c." Taken as a caution, the above is useful; but experience since his time has proved, in this capricious disease, that there are cases in which anti-spasmodics will relieve, as much as in others they will increase, the oppression.

I have mentioned a variety of these medicines, since, from difference of constitution and other causes, if one prove ineffectual another may perhaps succeed. A medicine that will stimulate the nerves of one individual may very possibly calm and soothe the nervous system of another.

Expectorants.—In accordance with his theory, Dr. Bree has enlarged upon the use of this form of medicine in the paroxysm; but since, independently of other reasons, auscultation utterly refutes his doctrines, I shall reserve entering into any detail respecting expectorants, until I come to speak of the treatment to be observed during the periods of intermission. Indeed, many of the remedies to which I have already alluded, may be regarded as partaking of the powers of this class of medicines. Whatever will remove the paroxysm, of course appears conducive to expectoration, since the shorter the time of its continuance the sooner will the discharge come on: although its quantity will be inconsiderable compared with that expectorated after a fit of long duration.

The expectoration should be a secondary consideration with the physician, whose whole attention should be directed to the speedy termination of the attack. Attempts injudiciously made during the presence of the paroxysm to promote the secretion, would be likely to cause such irritation of the bronchial mucous membrane as to superinduce a catarrh, and eventually accelerate a recurrence of the asthmatic state.

Again, I much doubt whether benefit has ever been derived during a fit from expectorants, administered as such; being inclined to believe that in all cases of idiopathic asthma, in which their use has been followed by good results, these have arisen from their indirect influence in other ways, rather than from any direct operation in accordance with their name. For instance, I very frequently order the following compound during an asthmatic fit: of calomel, ipecacuan, powdered squill, and the oxysulphuret of antimony, each a grain, to be made into a pill, which may be repeated at intervals of half an hour until the patient has taken three or four doses; and this not with the view of increasing the expectoration in consequence of the soothing effects produced by this combination on the chest, put on account of its general effects. This compound determines to the surface, gently affects the bowels, increases the secretion of the kidneys, excites incipient nausea, and by these and other modes of acting tends to remove the thoracic obstruction.

Another form I am in the habit of employing, and which I sometimes alternate with the pills I have just mentioned, is the following: an ounce of either camphor mixture, or almond emulsion, fifteen grains of nitre, ten of calcined magnesia, ten minims of tincture of squill, and twenty of henbane; in addition to which I occasionally order some agreeable syrup. At times I administer it alone, with intervals of an hour or two, until the dose has been twice or thrice repeated. Squills appear to have been regarded by Floyer in a very favourable light; and he gives an amusing description from Galen of the various excellent qualities of the vinegar of squills. "It makes the senses quick, the colour good, and the respiration easy; it helps digestion, it loosens the belly, it provokes urine, discusses wind, and abates the fulness of flesh." To the use of this wondrous medicine, Galen seems to ascribe the longevity of Pythagoras, whom he states to have been its inventor, and who lived to the age of one hundred and seventeen. Floyer adds, out of the same author, a formula for the wine of squills, which, combined with honey, he affirms that the Roman emperors were in the habit of taking to prolong their lives.

If any reader should wish to try the effects of this "elixir vitæ," which at all events will not shorten, however dubious its power of extending existence may be, its composition is as follows: ℔xij. of wine to one of squill; honey, two or three parts to be added, to make it agreeable. The dose was ℥i. before a meal, and half the quantity after, which Floyer observes is too much. The great difficulty would be in procuring the antique wine, but perhaps Madeira or sherry might prove no inefficient substitute. Since vinegar has been mentioned, I may add that a tablespoonful of raspberry vinegar in half a pint of water will be found both grateful and serviceable, when there is a feeling of heat in the stomach, and more especially to persons of full habit.

Laxatives.—Asthmatics of some standing are, generally speaking, subject to rather a relaxed state of the bowels than otherwise. Should there be a degree of torpidity in the intestinal canal, it will be necessary to relieve this gently; and if the fit appears directly after a meal, accompanied by symptoms of dyspepsia, the purgation ought to be so active as to remove the offending matter. Patients who have but newly begun to suffer from asthma are, contrary to the received opinion, inclined to constipation; and any continuance of this state is carefully to be guarded against. Should the asthmatic eat too plentifully soon after the abatement of the fit, before the digestive apparatus has had time to recover its functional power, it is probable that some indigested aliment will remain to irritate the stomach and duodenum, which if unremoved will be likely to accelerate a second attack. If an emetic be unadvisable, recourse should in such case immediately be had to some laxative, and this is the practice I usually prefer. Whenever laxatives are indicated, it should be remembered that those are best suited to the asthmatic patient which will gently and steadily excite the peristaltic motion, and that violent purging should never be resorted to. An excellent form will be found to be of jalap, rhubarb, and magnesia, eight or ten grains each, given in some suitable vehicle; and its repetition may take place, if necessary, after the space of two or three hours. Should there be any symptoms of a febrile state, five or six grains of the hydrargyrum cum cretâ may be added to the foregoing compound. Another mild aperient may be formed as follows: half an ounce of the compound decoction of aloes, and the same quantity of infusion of senna, to which two or three drachms of manna may be added. In a few cases in which I have found the alvine obstruction great, and resisting the milder purgative medicines, I have ordered, and with excellent effect, half a drop to a drop of croton oil in some gruel. When, on being called in during a paroxysm, I find that the bowels have been for some two or three days painfully confined, I invariably employ this medicine, and there is no agent in the materia medica on which in similar instances I place greater reliance. Besides being an efficient and certain laxative, its anti-spasmodic powers are remarkable; and I was first led to pay particular attention to this property of the croton oil in the case of a gentleman (then occupying his country residence at Fulham) whom I attended, in conjunction with Sir Astley Cooper and Mr. Lawrence.

In consequence of his horse's stumbling the patient had fallen and fractured one of the nasal bones, a portion of which afterwards came away from the lacerated wound. A few days subsequently tetanus of the severest description occurred, in which complete opisthotonos and pleurosthotonos were manifested. So long as the complaint lasted, he took croton oil as a purgative; and I constantly observed that its exhibition was followed by an extraordinary abatement of the fearfully spasmodic state under which he laboured. On a careful reconsideration of this gentleman's case, I was led to attribute his recovery to the use of this substance chiefly, notwithstanding many other remedies were of course employed. Impressed with this conviction of its beneficial action, and particularly of its well-marked anti-spasmodic powers, I have eagerly embraced every opportunity of testing the latter, and never once had occasion to regret my reliance on their existence.

Having previously noticed some substances as antispasmodics to be administered in the form of an enema, which are likewise laxatives, I need not recapitulate them, but content myself with referring to what has been already said.

Galvanism.—There are few subjects on which the discordant opinions of medical writers are more strongly exhibited than on the advantages derivable from the use of galvanism. It is certainly strange to find the results obtained by practitioners, so diametrically opposed as they are on this point. How far such contrariety may be creditable to the profession is another question, which would involve too long a discussion to admit of being canvassed in this place.

The employment of electricity, much advocated by Sigaud de Lafond, fell not long after his time into disuse; but some recent experimentalists have revived it, more particularly under the galvanic form. A modern writer, Dr. Wilson Philip, in his "Inquiry into the Laws of the Vital Functions," has affirmed that in no less than twenty-two cases of dyspnœa, he gave decided relief by transmitting the galvanic influence from the nape of the neck to the pit of the stomach. For my own part, I have tried galvanism to a great extent, and with the utmost patience. Both at the Infirmary for Diseases of the Chest, and at the Central Infirmary, I have made repeated experiments in the presence of several pupils, and medical practitioners likewise; and, out of numerous cases, there were only two in which any benefit was obtained from its use.

In the case of an asthmatic patient, a man of middle age, who was under the influence of *bulimia* or voracious appetite to such a degree as to threaten a famine within the walls of the Infirmary, I resorted to galvanism as a *pis aller*, a last effort against the inroads made by this Nimrod of the kitchen, and found it fortunately stop the maw of this second Justice Greedy, although the asthma was not one whit the better.

The other case was that of a young lady, a private patient, subject to hysteria and occasional dyspnœa, and whose appetite at times failed, and at last wholly deserted her for upwards of three weeks, whilst at the same time her stomach exhibited great irritability. After a trial of galvanism for no long period, fresh energy seemed to be imparted to the digestive organs, and her appetite was restored to a healthy state.

One highly interesting case, in which I gave galvanism the fairest and fullest trial in my power, was in the person of a female aged thirty, in whom nervous asthma had supervened upon one of the most singular convulsive maladies I ever witnessed. The poor woman would be suddenly seized with a trembling of the arms and limbs extending by degrees to the whole of the body, and used to sink on the floor racked in every joint and muscle with convulsion. After a time, the arms and limbs would become more and more violently agitated, being lifted up and let down with singular rapidity and force, whilst at intervals the body was actually raised writhing off the ground. During these attacks, her face was pinched and contracted, the lips bloodless and constricted, the extremities deadly cold, and her stomach, as she stated, felt as if a lump of ice. The origin of this malady, according to her own supposition, was owing to the premature termination of the lochial discharge, two days after the birth of her third child. Mr. Bowden, at that time my talented colleague, being surgeon to the Infirmary, and who was also Secretary to the Medical Society of St. Bartholomew's Hospital, took along with myself the deepest interest in this curious case, and both witnessed and participated in the whole of the galvanic experiments resorted to during the presence of the asthmatic attacks, I am sorry to add, fruitlessly.

Thus the reader will perceive that the whole of my experience, which has, I believe, extended to a wider field than has fallen to the lot of many, leads me to conclusions entirely different from those of Dr. W. Philip. I did not confine the trials I made of galvanic influence to the idiopathic form, but extended them through various symptomatic species, and with results which have convinced me that its medicinal agency has been overrated.

Moxas.—I am not aware that any preceding writer has recommended the use of the artemisia chinensis, or moxa, in the nervous asthma. The actual cautery was a favourite remedy with the ancients, both for this disease and phthisis; and Hippocrates and Celsus each recommended in the latter the application of the red-hot iron to a horrible extent. Ætius, indeed, went so far as to order fourteen ulcers to be made and kept open between the head and the diaphragm; and fearful instances of this cruel practice are not wanting even in modern times.

Since the employment of the moxa is productive of scarcely any pain as compared with the cautery, and its intent and result are nearly the same, I have advised it in idiopathic asthma, and this occasionally with some success. The most favourable situations for its application are over the course of the cervical and thoracic ganglia. Four or five moxas made of cotton, of the size of a pea, moistened with oil of turpentine, and applied in succession, are likely, when the patient can "screw his courage to the sticking place," to effect a speedy resolution of the paroxysm. They should be kept on fire until the sensation amounts to absolute pain, and then may be lightly removed by a fillip of the finger.

The position which I have before noticed as chiefly indulged in by the asthmatic patient, that of inclining forwards, is also highly favourable to their application on the dorsal region. It is likewise not improbable that even before it is applied, the effects of imagination will produce as beneficial a result as the operation itself.

In two cases especially I experienced the happiest effects from the use of the moxa; and in one of them, a periodic asthma, I am convinced that the return of the paroxysm was considerably protracted by the nervous apprehension of the operation which the patient, a young person, had conceived. So strong is the affinity between all diseases of nervous origin, that I have known a young female of delicate organization, and consequently high susceptibility of impressions, contract asthma by simulation, as is known to have now and then happened in hysteria, chorea Sancti Viti, or St. Vitus's dance, and other disorders of a similar nature. Perhaps the best remedy in such case is that recommended by a Dutch professor, who, finding hysteric complaints accumulate in the female wards of his hospital to an unbearable degree, ordered a searing iron to be kept always heated, as an infallible application, and hysteria in all its forms vanished forthwith.

Whilst on this subject, I may mention that a lady of rank, whose nervous sensibility is of the acutest description, and who is likewise asthmatic, informed me that she had been much troubled some years ago with a pain in the right side, situated, I should conclude from her account, in the ascending portion of the colon, and that it was successfully removed on the first application of a moxa ordered by Mr., now Sir Philip Crampton, the present Surgeon-General of Ireland. Should I be called to this lady whilst she is suffering under a fit of asthma, the above fact would induce me at once to order moxas to be applied over some of the superior thoracic ganglia, with every hope of diverting any concatenation of morbid sympathy that might be present.

Ergot of Rye; or, Secale Cornutum.—This is a substance that, I believe, has never been tried but by myself in asthma, and to its employment I was led by reasoning from analogy. Since mercury, although a stimulant, is often used in case of inflammatory action, diuretics when the secretion of the kidneys is superabundant, diaphoretics in cases of excessive perspiration, it struck me that ergot of rye, which I have found eminently serviceable in various conditions of the uterus, might prove beneficial in asthmatic cases, where a morbid sympathy might be expected to exist between this organ and the chest. The principle of its use is, in fact, the opposite one to the old medical axiom, "contraria contrariis medentur."

Induced by the above considerations, I was led to make trial of this substance in female asthmatics, (not in a pregnant condition,) and from the result I would recommend its trial even in males. The form of its administration is various: ten or fifteen grains in powder may be taken a second time, with an hour's interval after the first dose, or an infusion of thirty grains in warm water at once. Sometimes the tincture may prove a more agreeable vehicle, as in cases of debility or irritability of the stomach. Though the action of the ergot is in all probability exclusively confined to the uterus in removing that morbid dilatation of this organ, which so often remains after delivery, from analogy, however, one might be induced to try its efficacy in similar states of the heart and air-cells. Thus, in nervous asthma, it may restore the air-cells, unduly expanded, to their natural state, by removing the spasm which counteracts their contraction. Although I have not used it to so great an extent as to warrant my pronouncing definitively upon its powers, yet I am inclined to suspect, that by its stimulating properties it may exert an efficacious action in some forms of unnatural dilatation.

Pneumatic Agents. — Various gases have been strongly recommended, and their use has been more particularly advocated by Dr. Beddoes. Of these, the nitrous oxyde gas, otherwise known by the name of the laughing gas, is likely to prove the most serviceable.

Although I place little reliance on the mere inhaling of these or any aeriform bodies, yet when asthma has supervened upon consumption, the mechanical action of inhalation, as explained in my treatise on this last-named malady will, by aiding the curative process already begun by nature, be productive of decided benefit.

Much stress has been laid upon the imperfect oxygenation of the blood, as the cause of asthma; were this the case, the simple respiration of oxygen would prove a certain and speedy remedy. The truth is, that the blood is imperfectly oxygenized for the same reason that the respiration is impeded, namely, a congested condition or convulsive action of some portion of the air passages. The obstruction once removed, the breathing returns to its natural state, and we find no signs of deficiency in the oxygenation.

Hygienic Treatment during the fit.—Floyer remarks, and experience in his own person dictated the language—“The asthmatics are best fasting, and under a very frugal and simple diet.” In fact, experience and reason here go hand in hand.

Of all articles of diet, coffee is that which has obtained the greatest reputation, as possessing medicinal powers in addition to its nourishing qualities. We have the united testimonies of Sir John Pringle and Dr. Musgrave to the fact of Floyer’s having derived great benefit from its use, notwithstanding his reiterated assertion in his “Treatise,” that every hot aliment is to be avoided. The former gentleman, however, was the first to introduce it into general practice, affirming it to be the best abater of the paroxysms of the asthma with which he was acquainted. Dr. Bree likewise recommends it, and undoubtedly it forms a grateful beverage, which may often soothe and refresh, if it do not positively check the paroxysm. As a general rule, the food should be light and nourishing, whilst all stimulants must be carefully avoided. The ordinary drink may be lemonade or ginger tea; and when coffee is taken medicinally, it should be drunk without milk or sugar, being made very strong in the proportion of an ounce to a cup.

There are many minor remedies which will contribute essentially to the ease and comfort of the patient during the paroxysm: bathing the feet, sponging the chest with warm water and vinegar, and using gentle friction to the same part, are all palliatives which should be sedulously attended to. The position in which the asthmatic is placed is also of considerable importance. He should be directed to sit in an arm-chair, leaning forward, or with his head inclining on a table or the back of a chair. His apartment should be well ventilated, and no obstacle be opposed to the free admission of air. Perfect quietude in the house, and freedom from any annoyance of unnecessary visitors, or from business which can be deferred; in short, exemption from anything mental or physical, likely to produce irritation, are all considerations of no small magnitude in the treatment of the asthmatic.

I would suggest that in cases of purely convulsive asthma a change of air, as for instance from the air of the city to that of the country, or *vice versa*, might be attended with speedy relief when the severity of the attack or the means of the patient did not interfere with such a removal. So various and almost imperceptible are the modifications of this disease, that it is hardly possible to enumerate too many auxiliaries; since, although they should by no means be used indiscriminately, and with little interval between each, yet as even those found to agree the best will in time lose their effect, it is advisable to possess a knowledge of others which may be recurred to. That I have not spoken of tonics is owing to my belief that in this species of asthma they are too often decidedly prejudicial in the fit.

RULES TO BE FOLLOWED IN THE INTERMISSION.

It cannot be too strongly inculcated, that on the treatment pursued in the intermission, or interval between the fits, the cure of the patient chiefly depends. The intelligence of the practitioner, and compliant observance of the asthmatic, are then equally called for, and each indeed is alike inefficient without the other. Even in inveterate cases, in which a cure is not to be hoped, the return of the paroxysms may, by judicious treatment, be indefinitely deferred, and to defer the hour of suffering cannot but be considered as worthy of every effort.

The main points to be attended to are the age and the constitution of the patient, the specific character of his disease as complicated or uncomplicated, and its remote as well as exciting causes. By these considerations must the treatment be regulated; and by a nice adaptation of the remedies to these various conditions, the asthma, intractable as it is generally supposed to be, will be found to be powerfully swayed. Should the complications of the disorder be distinctly marked, it is necessary to attend to them in the first instance; and they may be treated, generally speaking, in the same manner as if no asthma co-existed with them. But, when the peculiarities appear entirely subordinate to the primary complaint, the treatment may be pursued uninfluenced by any reference to the minor and relatively unimportant associations.

In the observations I have to make on the treatment of asthma both medicinal and regimenal during the intermissions, I shall notice first the treatment to be adopted after the fit, viz. the abstraction of blood —then the various effects of change of air—of the atmospheric variations in any given place—of the different classes of medicines usually employed in this disease,—and shall close this portion of the work with an account of the dietetic rules to be followed by the asthmatic patient.

No sooner has the fit run its course than prospective measures should be resorted to. The beginning of the intermission ought to be at once seized, in order to lay the foundation of a future cure.

I have already observed, that when the fit is present, the chief object the physician should have in view is to abridge its duration by every means within his power; not so much with the confined aim of relieving the mere immediate suffering, as with the more enlarged purpose of preventing the disorder from becoming habitual. And, following up this by a corresponding practice, it is incumbent on the practitioner, after the attack has fairly subsided, to relieve the patient as soon as possible from any residual effects of the disease. It is, however, requisite to allow sufficient time for the disappearance of the symptoms, which are the sequelæ of the attack.

To expect that any sudden change can take place from the violence of the paroxysm to a state of complete ease, would be to look for impossibilities. For many hours after the subsidence of the more urgent symptoms, the breathing will continue affected; and the patient will be sensibly reminded that he is not yet "on a bed of roses." In a word, comparative ease must not be mistaken for complete restoration. In general, if I find these secondary symptoms continue for twenty-four hours, I then order leeches to be applied to the chest, with a view of diminishing irritability, as well as of removing any engorgement that may happen to exist. In those cases in which either the previous experience of the patient, or those signs which the practitioner, acquainted with the disease, will easily recognise, threaten a speedy return of the paroxysm, the use of leeches is especially indicated, and their prompt application will often prevent the recurrence of the attack. It may sometimes occur that the fits will manifest themselves, almost without intermission, for two or three days and nights, and the subsidence of one will be, as it were, the signal for the appearance of another. The necessity of mitigating the irritation approaching to the inflammatory condition is here obvious; and I may observe that the good effects of judicious local depletion have not, as yet, been sufficiently recognised by the medical world.

There are many reasons which render the local abstraction of blood, in the majority of instances, not merely a safe but a highly beneficial remedy. In asthmatic cases, the leech will be found to act in a double capacity, that is, both externally and internally. It relieves the muscles of the chest, strained, sore, and painful from the constant exertion caused by the spasm; and soothes, by its sympathetic effects, the abnormal excitement of the lungs. It has been frivolously objected that where no direct communication by means of nerves, blood-vessels, and absorbents, exists between the internal organ and the exterior covering, no good can arise from the employment of leeches; although daily, nay, hourly experience refutes the assertion. We know that intense head-aches and inflammation of the brain often yield to the salutary influence of this little animal; and yet, in addition to the bony tables of the skull with their diploe, there is the duplicature of the serous membrane between the scalp where the leech is applied, and the brain. Similar exemplifications will be found in many cases of diseased joints, or of affections of the testes, in both of which the chief relief afforded must be by sympathy.

Again, should inflammation occur in the abdominal cavity, although two surfaces intervene between the viscera and integuments of the abdomen, the effects of sympathy are at once observable on the application of leeches. It cannot, indeed, be denied on any tenable pathological grounds that abstraction of blood from a healthy surface over a diseased part (notwithstanding there exists no direct connection between the two) will, in general, relieve the latter. Thus the lungs are no farther removed from the remedial agency of the leech than the brain or the peritoneal cavity. Between the exterior surface and the lungs there intervene the ribs with muscular substance, and a serous lining, together with the reflexion of the same membrane; and yet relief follows in spite of whatever may be fancifully urged, I cannot say reasoned, to prove that it should not.

On account of the sitting and upright position which the asthmatic is usually obliged to assume, there is ordinarily a somewhat congested state of the lower lobes of the lungs, arising from the gravitation of the blood; and for this and other reasons I generally order the leeches to be applied outside the mammæ, over the sixth and seventh ribs. Applied here, they directly or indirectly give relief to the inferior margins of the pectoral muscles, to some of the digitations of the great serratus muscle, over which the branches of the external respiratory nerve of Bell are distributed; to that portion of the intercostal muscles near which they are fixed, to the muscular substance of the heart, to the diaphragm, with the viscera immediately beneath it, and to the upper portions of the abdominal muscles which may have suffered from the spasmodic state of the chest.

These are not the only parts which come within the range of the influence exerted by the local abstraction of blood, since the application of leeches possesses a deep-seated penetrating power, and there is a radiating sympathy which extends in various directions from the place of election.

Beddoes was of opinion that the effects of a blister extended to a foot in depth; and although those of the leech are much limited in comparison with this, yet they may be said to reach almost that extent in circumference, taking the place of their application as the centre whence the circle is described.

In not a few instances of convulsive asthma I have observed, at the termination of the attack, a catarrhal state, chiefly of the trachea, although no catarrh was discoverable previously to the fit. I am in the habit in such cases, as soon as there are a mucous râle and a sense of straightness in this part, to order leeches to be applied to the upper portion of the sternum; and this practice, judiciously followed up after every attack in young patients, will be found effectually to prevent the disease becoming habitual. Should the removal of the catarrh be neglected as merely the effect of the paroxysm, and on the supposition that it will soon pass away, it may in time become a cause, and finally render the disorder habitual. Nothing, indeed, can be fraught with worse consequences to the patient, than the suffering of any secondary symptoms to be converted by neglect into primary ones. Should the catarrh be allowed to remain unchecked, the subacute excitement of the mucous membrane will gain ground, the normal amount of the secretions of the mucous glands be destroyed by the undue determination which takes place towards the trachea, and the disease rapidly degenerate into a chronic form.

It sometimes happens, although not commonly, that inflammation of the chest will manifest itself at the close of a severe asthmatic attack, and then leeches alone will not be sufficient. Abstraction of blood from the arm is likewise to be resorted to, and, indeed, cannot with propriety be omitted. It is a circumstance often to be regretted in this disease, and one which not infrequently occasions the worst results, that the comparative ease enjoyed by the patient during the intermission, and his exemption from positive pain, render him careless and apt to neglect the admonitions of his medical adviser. A little reflection and exercise of good sense are necessary to rouse him to a due feeling of the fallacy to which he is blindly submitting; and if he be conscious that the acquiescence of the patient is the vantage ground of the physician, he will hardly be so far his own enemy as to refuse it. A timely submission for a short period, and a slight forbearance from the immediate indulgence of his own phantasies, will purchase months, perhaps years, of ease.

Having explained, and I trust satisfactorily so, the cause of the dyspeptic ailment which forms one of the ordinary concomitants of asthma, I need not enter into any reasons for advising that, next to any tracheal or thoracic complaint, which may either remain behind or which may supervene after an attack, the attention be especially directed to the state of the digestive functions. It is with this as with the preceding ailments; neglect will be likely to convert the dyspepsia from an effect to a cause. Here again the application of leeches to the pit of the stomach operates beneficially. It is a puerile mistake to imagine that aromatics will remove the flatus attendant on a dyspeptic state. The only effectual and rational practice is to relieve congestion of the mucous surface by a topical application, whilst gentle laxatives will disperse gastric and intestinal uneasiness, the results of internal congestion.

It may not be irrelevant to mention here that asthmatics suffer very much from errors in diet, more especially when their condition is aggravated by dyspepsia, which is itself frequently the cause of asthma. It may be mentioned that Bree seems to have borrowed freely from Floyer in his remarks on indigestion. With respect to the meat and drink which is most agreeable to the asthmatic, and that which is most improper, Floyer deprecates the use of all strong liquors. He conceives that strong wines inflame the animal spirits, and that all strong malt liquors increase the fits of the asthma. He mentions the case of an asthmatic who, upon any tendency towards a fit, drank plentifully of milk and water, which removed the inflation of his stomach. I shall say more on this subject when I come to consider the dietetic treatment.

An efficient and useful medicine to be taken is formed of rhubarb, magnesia, and a small quantity of hydrargyrum cum cretâ, together with mucilage, in camphor mixture. As a mild laxative, and possessing other valuable properties, I would recommend two or more spoonfuls of calcined magnesia, with lemon juice. It is cooling, and, in general, grateful to the patient. I usually advise the dose to be repeated every morning, or every other morning, as circumstances may require, until the dyspeptic symptoms entirely disappear. A very frequent complaint made by asthmatics is of pain at the pit of the stomach, in the direction of the ensiform cartilage. This cartilage forms, what may be termed, a central point, in which, by tendons, or fleshy fibres, important muscles either are inserted, or have their origin. The spasmodic state of the chest in asthma influences the action of these various muscles; and since the strain upon them is in different directions, each reacting on the other, the pain produced is often so considerable as to be mistaken by both physician and patient for internal inflammation. I have often been, I was about to say amused, but certainly induced to smile by the over-anxiety displayed by medical practitioners, as well as the asthmatics themselves, with respect to a sensation so easily accounted for by the anatomist.

It may not be unimportant to observe that I have frequently witnessed similar misapprehensions concerning pain felt in the same, or adjoining regions, arising from a similar cause, and accompanying pectoral disease of an entirely different form. The patient, therefore, may, in general, dismiss all fear on this head. There are many little "means and appliances," which, for want of a better, I will class under the general term "soulagements," a word which we ought to envy our Gallic neighbours. These will, collectively, prove of great value to the poor sufferer; as whatever tends to relieve, or comfort, should not be disregarded. Of these, moderate friction applied to the chest, after the entire subsidence of the paroxysm, and effected either by the flesh-brush, or by means of a piece of flannel, sprinkled with hair powder, will be found very efficacious. The pain arising from great tension of the muscles, causing sensations of soreness and straightness of the chest, will speedily yield to this simple remedy.

Should circumstances permit, a removal as soon as it can be with safety effected, is highly desirable. The locality, in which the asthmatic has been attacked, should be changed, as from town to country, or *vice versâ*. Frequently indeed a removal from one apartment to another, even in the same house, is productive of benefit. So entirely subservient to the nervous temperament is this disease, that I have known a patient complain of his breathing being affected, if he happened to enter a room at the back of his house; and fancy that residing in the front was essential to his health. Change even to a worse air will often do good; and in these instances at least, we may gainsay the aphorism of Horace, "*cœlum, non animum mutant, qui trans mare currunt.*"

To all patients indiscriminately, removal of course is not necessary. It is imperative only on those who are certain to be seized in some determinate locality. They, who are fortune's favourites, and who have but to wish in order to act, will need but little persuasion on this point: and, even when circumstances are unfavourable, every effort should be strained to accomplish so important a step. To illustrate this I may mention that a servant of a Mr. S——, a gentleman high in office in the East India House, happening to be a martyr to convulsive asthma, was persuaded to accept a situation in Devonshire, although both master and man equally regretted the change; and that, on his acceding to the proposition, painful as it was to him who had so long been an attached and faithful servant, a complete cure followed the change of residence. The poor fellow had derived great benefit from the measures I had recommended, and it was the fear of his relapsing into his former distressing state from the health to which he had, under my care, been restored, that rendered Mr. S.

doubly anxious for his timely removal before an atmosphere, unhealthy to him, should bring back the disease.

Being on this subject, it would be a poor return for generosity were I not to mention that the kind-hearted Mr. S. was so delighted at the success which had attended my efforts in his domestic's behalf, that he honoured an anniversary dinner which happened to be given at the time in aid of the funds of the Infirmary for Diseases of the Chest, not only with his his own presence, but with that of twelve or more gentlemen, friends of his, who all became subscribers for life to that institution.

Another patient of mine, one of our most celebrated dealers in horses, who removed some years ago from London to an elevated locality at Brixton, and who, while he resided in the metropolis, was a victim to asthma, derived considerable relief from change of air.

We find that from whatever point of the compass the wind blows, some asthmatic or other will be incommoded by the prevailing one, although the majority, perhaps, are affected by the easterly, or the winds which blow from any quarter, whether north or south, within its range. Nor are the effects of locality a whit less variable. A high will agree with one asthmatic, a low situation with another; and I would therefore advise those who have it in their power, to remove from place to place, until they meet with some residence in which the process of respiration will go on more easily than elsewhere. This advice, although it may appear somewhat fantastical, is in reality the best that can be given, since in no disease do we find so many anomalies, with respect both to atmospheric and local peculiarities, as in asthma. One patient cannot sleep in one particular town without the penalty of a paroxysm; another is certain to undergo an attack should he venture to sleep out of the same place. This was the case of the great Duke of Ormond, whose only place of refuge was Kilkenny, to sleep out of which was to incur an asthmatic attack. Could this immunity arise from the well-known property of the coal of this district, which is said to burn "without smoke?"

Van Helmont tells us of a patient who "*finds himself worse in mountainous districts, and therefore dares not remain for the night in Brussels.*" I remember reading in a medical work an account of a gentleman who was freed from his asthmatic complaint by removing only one mile from the town in which he had resided, with this exception, however, that when the wind blew from the town then "came his fit again."

The old proverb which, in its Latin dress, "*Quod nocet alteri, alterum juvat,*" does not look amiss, but which in its English garb is not quite the thing for "ears polite," although equally as true, to wit, "what is one man's meat is another's poison," was never more fully verified than in this complaint. Floyer says, "I have observed the fits of the asthma to happen in all the various points of the wind;" and as a general rule he observes that, next to the east, "the south wind is offensive by the moist air it brings; but the west and north are least prejudicial here in England."

This intelligent writer enlarges, much to his own delight, and certainly much to the amusement of the reader of the present day, on the mode in which the changes of the atmosphere affect asthmatics, and enters into an elaborate disquisition to prove "that the spirits of animals be very elastic, and those of asthmatics much more so, because so very windy."

It must not, however, be concluded that change of air is to be sought at random. There are many circumstances which will serve as indices to the experienced physician of the kind of climate likely to agree best with his patient. The general constitution, the concomitants of the disease, whether chiefly displaying dyspepsia, or some form of bronchial disease, the period of life, and other minutiæ, ought all to be taken into consideration. Nor is the season of the year to be left out of the account. The elevation which may prove of the utmost benefit in summer, will often be too keen in winter; and the more sheltered situation desirable in the latter, may prove too confined, as the spring draws to a close. It also often happens that the benefit likely to accrue from a judicious change of residence is frustrated by the physician's neglecting to warn the patient that this alone is not to be implicitly trusted to in all cases. The regimen forms a most important consideration; and it frequently occurs that without the auxiliary aid afforded by its due regulation, a change of residence is totally inefficacious which, in conjunction with proper directions on this head, would have restored the asthmatic to that health in pursuit of which he has sought another home.

On the influence of cold weather, Floyer makes the following observation: "In very cold weather, the fits of the asthma are less violent, because that compresses the expansion of the spirits; but, before any great snows, the asthmatics usually have a fit, and that a severe one; or at least, when the fit does not succeed, they feel a fulness at stomach."

I cannot resist the temptation of here introducing some additional remarks made by former writers, on the effects of the state of the air, &c. in asthma. Though obsolete and antiquated, the remarks are valuable, as being the result of accurate observation. These physicians cannot be denied the merit of being set down as close observers of nature, though their mode of explaining the various results may not suit our improved notions of physical science: the erroneous views which run through these different theories are referrible less to the men than to the times in which they lived. Floyer says, "In a dry state of air the spirits of the asthmatic are most lively, and they breathe free, there being then no vapours in it, or fumes to weaken the pressure of the air." * * * "'Tis observed that the intervals of the fits are largest in dry settled weather." Again, speaking of the effects of fog or mist, the same writer says, "When any mist arises, the asthmatic breathes difficultly, and finds an oppression on his spirits, especially a straitness and fulness at the stomach upon changes of weather, though the fit does not always succeed that complaint. The moisture of the air is most prejudicial to the asthmatic; whilst the watery vapours retain the nature of exhalations, because then they act most on the spirits, and cause the inflation at the stomach." On the influence of rain on the asthmatic paroxysm, he observes: "The rain when it falls does not much affect the asthmatic, but the watery vapours which precede it one, two, or three days, because the vapours weaken the pressure of the air, as appears by the barometer, which sinks sometimes before rains and great storms, and the asthma fits happen two or three days usually before such changes; but I have observed the animal spirits to be more nice, and predict the alteration before the weather-glass. It is observed by seamen that, if there be any bad weather in a month, it usually happens two or three days before or after the full or changes of the moon, which is the reason why the asthmatic fits happen at those times."

On the influence of these lunar changes, let me state what Bree says: "If the *changes* of the *moon* ever influence the motions in animal bodies, they may be supposed with great reason to excite the paroxysm of asthma. It appears that the attractions of the sun and moon at some periods combine their powers, and influence the gravity of bodies with greater effect." (See Bree on "Disordered Respiration," p. 168.)

Dr. Withers, who undoubtedly was an industrious physician, though deficient in pathological research, expresses himself thus on the importance of attending to the purity and temperature of the air in asthmatic cases:

"Pure air is highly requisite to the health of the human constitution; but it is particularly grateful and refreshing to the asthmatic patient. His lungs are often obstructed; there is not a free passage for the air; a less quantity of it is inspired, and consequently that quantity ought to be as pure as possible, that it may support properly the functions of life. Hence the *country* is far preferable to *large towns*, in which the smoke, dust, putrid exhalations, and other impurities of the air, are very offensive to the asthmatical. For though the air of towns, from some peculiarities of constitution, may agree better with a few than country air, yet this is no argument against the general fact. A dry state of the air . . . . is observed to be most favourable to those who are afflicted with this disease." The same writer, when speaking of the *temperature* of the air, deprecates the application of *external heat*, as being a powerful cause of asthma, from its inducing weakness and irritability of the lungs, predisposing them to convulsive affections, and rendering the constitution liable to be injured by cold and sudden changes of weather. He then warns the asthmatic against sitting in close rooms, near large fires, or lying hot at night. To this subject we shall return forthwith.

To sum up my observations on this matter, it may be held as a general rule, that a temperate and equable climate will agree best with the majority of asthmatics; and that in very relaxed and languid habits a dry bracing air will usually prove the most advantageous.

The domestic economy of the patient, if I may so term it, is the next point to be considered. In the same manner that the comfort of life depends upon a variety of minor circumstances, each insignificant in itself, yet the total forming an aggregate of paramount importance, so is it in illness, wherein numerous minutiæ, commonly disregarded, serve powerfully to soothe and relieve the patient, even if not directly essential to his cure. In the present instance, however, they become of almost as much consequence as the medicine and the diet. Of this nature are the clothing of the asthmatic, the arrangement of his sleeping room, and the temperature of his house. In the case of persons advanced in life, warm clothing, in cold weather especially, is imperatively necessary; but all superfluous apparel should be avoided by the young and active. There is a medium to be observed between undue exposure on the one hand, and on the other a too great solicitude about flannels and great-coats. The object to be obtained by a proper regulation of the dress is to harden and invigorate the frame, so as to render it less susceptible of the variations of the weather, and consequently less liable to attacks, which, if not actually superinduced, are generally accelerated by catching cold.

Should the patient have been used to an excess of clothing, he must diminish it very gradually, and begin the change in favourable weather only; all sudden alterations are bad. The use of flannel should be regulated by the habit and constitution of the patient. If accustomed to it from infancy, to leave it off would prove dangerous in the weakly;

and by the more robust it should be discontinued cautiously. Its effects are certainly weakening; and, if persisted in, the flannel waistcoat should, at all events, be put off when going to bed. The extremities, however, should always be kept moderately warm, particularly the feet; and even in the young I would recommend the Angola stocking in summer in preference to cotton.

There is no fault more common than that of sleeping, not only under an immoderate quantity of bed-clothes, but with the curtains so drawn as to impede the free circulation of air. In summer the curtains must always be removed, and in winter they should never be completely closed, but be left undrawn at the bottom, if not at the lower half of the sides. No precise rule can be given as to the amount of bed-clothes; this must, of course, depend on the weather, and the state of the patient's health. They should be as light as is consistent with moderate warmth, and it would be advisable to have the blankets and counterpane single, so that one may be removed or added, as occasion requires. A mattrass is preferable to a feather-bed; or a compromise may be struck, and the former be laid on the latter. The larger the sleeping-room the better, and it cannot be too lofty. Height is of more consequence than width.

The last consideration connected with these domestic arrangements, is the temperature of the house. And in this it is perhaps safer to err on the side of air and thorough ventilation than on that of an excessive temperature. The fire in the patient's sitting-room should always be proportioned to the size of the apartment; and, as a general rule on all these particulars, I know of no better than that given by Withers:—"To avoid much artificial external warmth, and to breathe always a cold or temperate air, but never a heated one."

Tonics.—No class of medicines has been more extravagantly lauded, or vehemently decried for its use in asthma than this; and from the same reason, want of discrimination. In the intervals of the pure asthma I seldom have had occasion to employ tonics; yet am I aware that they enter largely, though oftentimes injudiciously, into the general practice. Their use has, indeed, degenerated into abuse; since they have been indiscriminately applied to debility without reference to its exciting cause. After any inflammatory state that may exist has been subdued, there certainly do occur cases in which a judicious course of these medicines, systematically and stedfastly pursued, may afford benefit; but in ninety-nine out of a hundred I have found it the safest plan to let the vis medicatrix naturæ, the restorative power of nature, exert itself without their aid, and it has uniformly proved the best tonic. Among the evil effects produced by recurring to medicines of this classs in states, during which the practised physician will know them to be contraindicated, the following is one of the most injurious. Bronchial disorder, in some shape or other, is apt to manifest itself after the first appearance of nervous asthma, and the injury, which in such case will follow the injudicious use of tonics, is of a very serious kind. The mucous secretions of the body are interfered with, and perhaps in a more especial degree that of the bronchi; the breathing becomes more and more impeded from the constringed state of the vessels of the chest, in which cavity the lungs, as if imprisoned, struggle, as it were, to free themselves; thus the physician, by his predilection for tonics, brings on those very paroxysms he is studying to avert. It may be laid down as a general rule that, whenever plethora exists in an asthmatic patient, the employment of tonics is directly contraindicated, until the plethoric state be removed,—in fact the state of the system ought always to be duly considered by the practitioner in using this class of medicines. Their use is, in fact, hardly ever required, except when the "nimia medici diligentia" in the paroxysm has brought on such a degree of weakness as to call for decided restorative measures. At other times, the debility of the patient may have been so far superinduced, by want of care to mitigate the immediate consequences of an attack, and by neglecting to cut short the sequelæ as soon as possible, that the exhibition of tonics, under due regulation, may be imperatively called for.

Cold-Bathing.—Whatever advantage is to be derived from cold-bathing, arises in the first instance, and in the greater degree, from its serving as a preventive against cold, by rendering the body hardy; and in the second, from its general tonic effects. A surgeon of high eminence in his profession was for years in the habit of sponging the upper portion of his body, the year round, with cold water, both night and morning, and thus bade defiance to coughs and colds. But beneficial as cold-bathing, either partial or total, may prove as a prophylactic, it must not be recommended without extreme caution to the asthmatic. The only proper time for using it, if it is to effect any future good, is during a complete intermission. Pulmonary inflammation is apt to result from its incautious use; like most other powerful remedies, it is a two-edged sword, which, whilst employed in defence, may wound its holder.

Of the several methods of cold-bathing, as total immersion of the body, the shower-bath, and partial ablution by means of a sponge or flannel, the latter is the more advisable to commence with; and the second the most efficient after the constitution has been, by degrees, sufficiently prepared to sustain the shock. When we begin with sponging the body, a small quantity of vinegar, or a handful of salt, may be added to the water; and the body should be quickly dried with a towel coarse enough to excite a healthy glow by its friction. The best time for the operation is the morning, on leaving bed; and after continuing it for some time it may be repeated at night. When the frame has become sufficiently strengthened by perseverance in this plan for some weeks, the shower-bath may be employed; and when requisite, the shock will be rendered infinitely more effectual by having the feet immersed in warm water, by means of a pan placed at the bottom of the bath.

Among the ancients, Cælius Aurelianus is the only medical writer who has expressed an opinion on the expediency of cold bathing in asthma. He merely observes that a residence on the coast, with bathing, is advisable for asthmatics; but it is to be regretted that he has handed down to us no cases to corroborate and illustrate his views.

Of all the accounts of the effects of bathing hitherto published, the description given by Dr. Smollet of his trial of the cold-bath, is the most interesting, as well from the celebrity of the writer as from the spirit of the narrative, and the singular good fortune which attended an experiment, in his case, of a very dangerous nature. He writes as follows:—"In consequence of a cold, caught a few days after my arrival in France, I was seized with a violent cough, attended with a fever and stitches in my breast, which tormented me all night long without ceasing. At the same time I had a great discharge by expectoration, and such a dejection of spirits as I never felt before. In this situation, I took a step, which may appear to have been desperate. I knew there was no imposthume in my lungs, and I supposed the stitches were spasmodical. I was sensible that all my complaints were originally derived from relaxation. I therefore hired a chaise, and going to the beach, about a league from the town, plunged into the sea without hesitation. By this desperate remedy I got a fresh cold in my head; but my stitches and fever vanished the very first day; and, by a daily repetition of the bath, I have diminished my cough, strengthened my body, and recovered my spirits."

The good genius of the doctor must certainly have intervened, for a more hazardous step was never taken. The fever, and stitches in the breast, prove he was labouring under the orgasm of pleurisy, and before lymphatic secretion had taken place; and had the experiment been made a day or two later, the world would probably have been deprived of the immortal "Life and Adventures of Humphrey Clinker."

To sum up my remarks on cold-bathing, I would recommend the patient to have recourse to it only in the absence of every symptom of asthma; and to prepare himself for its use, in order to lessen as much as possible every chance of taking cold. When commenced and pursued with due precaution, it becomes a valuable agent in diminishing the susceptibility to cold; in subduing the morbid sensibility of the entire system, and more particularly that of the bronchial membrane, in improving the powers of the digestive organs, increasing the vigour of the circulation, and in enabling the patient to walk out in the open air without the risk of aggravating his disease and inducing inflammation of some of the structures within the chest. Such an occurrence is calculated to do as much harm by discouraging the patient, as by depriving him, for that time at least, of the benefit likely to accrue from the protecting influence of bathing.

Should the asthmatic patient be troubled with other pectoral symptoms not essentially connected with his asthma, or with symptoms indicating disorder of the gastro-intestinal mucous membrane, &c., such states contraindicate the employment of cold-bathing in any form, and must be removed before this latter remedy be resorted to. The means of removing such states are, local depletion when necessary,—that is, when any lurking inflammatory action seems to be going on in the system; or, when venous plethora is observed to exist, tonics in combination with alkaline carbonates, accompanied or followed, when necessary, with gentle aperients.

Dr. Bree's eulogy on the use of the cold-bath in asthma I conceive to be too unrestricted, and therefore dangerous; he states that no single remedy is of more value in all species of the complaint during the absence of the paroxysm.

The mineral waters have been also recommended as capable of affording valuable aid in the treatment of asthma. The Leamington and Cheltenham waters are those which have been principally resorted to by asthmatic persons in this country. The value of a course of warm mineral waters is most apparent in those cases where asthma is complicated with irritation existing either in the bronchial or gastro-intestinal mucous membrane. The continental springs most prized are those of Carlsbad, Ems, Schlangenbad, and of Bonnes and Cauterets in the Pyrenees. The effervescent ferruginous spas, such as the Schwalbach spa, situate in the duchy of Nassau, have been recommended in cases where the asthma occurs in debilitated constitutions. The waters of this spring contain, in 1000 gram. of water 6 grains of carbonate of iron, and very minute quantities of chloride of sodium and sulphate of soda. In none of the ferruginous waters of Germany is the disagreeable flavour of the iron so well masked by carbonic acid as in those of Schwalbach.

The Sulphate and Oxide of Zinc.—I have frequently tried the first of these preparations in convulsive diseases, as hysteria, chorea, and epilepsy, with benefit to the patient; and am therefore led by analogy to conclude that the last, which is frequently used on the Continent in hooping-cough, may be advantageously employed in cases wherein nervous mobility is joined to so weak a state of the stomach as to preclude the exhibition of stronger tonics. In a disease of so variable a character as asthma, we can hardly be acquainted with too many remedies to which we may have recourse, although the young practitioner must be warned against flying rapidly from one to the other, or making use of them without distinction of their various properties. Some physicians consider the oxide preferable, as being more anti-spasmodic; but this, if correct, is more than counterbalanced by the superior convenience of the sulphate, which may be made to concentrate the same virtue in a much smaller bulk. The oxide is more generally known to the profession from the warm, indeed, injudiciously warm praises of Withers; and its ordinary dose, as prescribed by him, appears to have been from ten to fifteen grains. He observes, that it is to be administered only in those instances in which plethora or fulness of blood is not present.

Either the oxide or the sulphate may be employed with most advantage perhaps, in cases in which those passages which are the immediate recipients of the air permit a preternatural secretion of fluid, arising from the relaxed state of their mucous tissue.

Preparations of Iron.—The preparation of iron formerly most recommended, though for what particular reasons I really cannot say, is the sesquioxide. Floyer speaks unfavourably of it; and I rather incline to his opinion than to those of Laennec and

Bree, the latter of whom seems to place much reliance on iron; and, indeed, he goes so far as to say that "the preparations of iron are to be preferred as essential means of cure." Floyer states that "the steel, by its stypticity, stops the breath;" and, speaking of the chalybeate mineral waters, he says, "the steel affects the head with a drowsiness and giddiness, as all steel wines do;" adding, a sentence or two further on, "the German spa-waters did increase my fits." Laennec mentions that he found the subcarbonate of iron useful to patients of a chlorotic complexion, and that he gave it in graduated doses from a scruple to a drachm. If iron be admissible, it is certainly indicated in the case of patients of a lymphatic constitution, whose pallid countenance betrays a defective energy in their arterial system. The citrate of iron is one of the most elegant and manageable preparations we have of this mineral, and, in my experience, as efficacious as any other.

Bree seems to have generally combined the iron with some vegetable preparation, and I am inclined to attribute many of the effects, which he describes as following its use, to the drugs united with it, rather than to its own virtues. On some occasions I have administered ammoniated iron in the form of a pill combined with myrrh, and a stomachic extract, and this with some advantage. Whenever any preparation of iron is resorted to, the condition of the stomach should be carefully examined; since, by the particular state of the digestive functions, and of the system generally, its use will be indicated, or the contrary.

The most memorable instance that has come to my knowledge of perseverance in the use of iron for any complaint, is in the person of a noble individual, who, his physician, Sir James Murray, assured me, must have taken (the reader will allow for the hyperbole) enough of iron to have built Menai bridge. The neuralgic affection of the face, under which this gallant nobleman so long laboured did not, I am grieved to add, yield to his constancy in trying the effects of this mineral.

With respect, however, to the expediency or impropriety of using steel in asthma, the same thing may be said as in other cases where steel is employed. We ought, I must repeat, to be directed by the state of the system generally, and more particularly by that of the digestive organs; in fact, the same circumstances will contraindicate the use of iron in asthmatic complications as in other affections where asthma may not be present.

Bark.—This is a remedy which has been very generally trusted to in asthma, but, with few exceptions, unsuccessfully. If the rules laid down by me for the guidance of the practitioner in the exhibition of preparations of iron are referred to, they will be found to comprise most of what is essential to be observed in the administration of bark. When the paroxysms bear a periodic character, when any symptoms of ague are complicated with those of asthma, or finally, when the state of the system indicates its use, bark may be employed; but, unless these conditions are clearly marked, it will prove not merely unavailing but positively injurious. In treating asthma, Withers recommends Dr. Cullen's method of using the bark, as adopted by him in intermittents, viz., to give the medicine the oftenest, and in the largest doses, just before the time when the return of the fit is expected. Floyer and Bree both speak favourably of it; the former ascribes to it the property of preventing the return of the paroxysm, and states that in the cases of symptomatic asthma, "though it cannot prevent the fits, yet it greatly relieves the sweats and faintness attending the fits, and headaches, and makes the intervals of the fits longer." He also cites the case of an asthmatic lady, who derived considerable benefit from the bark; her account of it is as follows:—"I took a drachm of the Jesuit's powder in a cordial water; and that first dose relieved me so sensibly, that it seemed to press down the stoppage of my breath; and, by repeating that, morning and evening, I perfectly recovered." The latter physician would seem to have borrowed the practice from Millar, ordering it to be combined with bitters or iron; and Laennec, a far greater authority than any I have yet had occasion to name, echoes the cry, contrary, indeed, to his usual practice of sifting and examining for himself.

Heberden, who appears to have been a diligent collector of medical *morceaux*, observes, that "in some a difficulty of breathing has returned periodically like a tertian fever, and has yielded to the Peruvian bark." The truth appears to be, that with respect to bark, as with other medicines in this more than Janus-faced complaint, medical men write partly under the influence of received opinions, and partly without a careful analysis of the precise state of the patient, and that precise stage of the disorder to which he may have arrived; so that a remedy is laid down as generally useful, which, in the hands of other practitioners, from want of this rigorous statement of facts, disappoints their every expectation.

The most elegant form is the sulphate of quinine, which may occasionally be combined with sulphate of zinc, in the proportion of a grain of each, taken together with six or eight grains of extract of poppies made into pills, to be taken night and morning. Even if bark be found beneficial, its use should be discontinued after it has been persevered in for a week or ten days, until some alteration of the health calls for its resumption. When the asthma wears a periodic character, the dose may be somewhat larger than that prescribed above, and it should be gradually increased, more especially when the attacks appear chiefly dependent on habit.

I pass over many other tonics, since what I have already said will be a sufficient guide for their use, and proceed to the most energetic of this class of medicines. It may not be unnecessary to repeat, that tonics are rarely to be employed until any subacute inflammation or morbid sensibility of the stomach and bowels is, by a soothing treatment, entirely subdued. When this has been inefficiently attempted, and irritability of the mucous membrane lining the stomach and bowels, or any other gastro-enteric disturbance still continues, I would most earnestly recommend the exhibition of nitrate of silver as a remedy I have long successfully employed in complaints dependent on similar states. Its value in epilepsy, one of the most violent disorders of the convulsive class, has been long established; and analogy led me to conclude that since its sole efficacy in this formidable complaint must depend on its lessening the sensibility of the nerves of the digestive organs, and thereby giving tone to the whole system, it must be equally beneficial in all cases in which there is reason to suspect morbid irritability of the primæ viæ. As there is every reason to believe that convulsive asthma, if it do not originate in, yet is not infrequently connected with dyspepsia, in such cases this remedy will be found the first on the list. The dose may vary at first from a quarter to half a grain, which after a few days may be increased to a grain, combined with extract of hop, chamomile, gentian, or any other stomachic bitter. This is to be taken twice a day, and may be continued uninterruptedly for a month, reckoning from the period at which the dose has been augmented to a grain, beyond which period I disapprove of its further continuance for the time being. It may be resumed after the lapse of a fortnight or three weeks, observing the same graduation in the doses. Some preparations of arsenic, as also of strychnine, have been recommended by continental writers in very inveterate cases: in the employment of such powerful medicines the greatest caution is required.

Stomachic tonics, as cascarilla, chamomile, calumba, gentian, &c., may, in union with alkalies, magnesia, or chalk, serve to correct the dyspeptic ailments which are oftentimes the distressing attendants on asthma. In general the feelings, and not infrequently the fancies, of the patient will form the best guide for the administration of this subordinate class of medicines.

The forms of indigestion are so various, that it would be an endless labour to particularize every medicine, simple and compound, which has been recommended as useful in each. I have given the principal; and if these cannot meet the exigencies which may present themselves, it is not to be expected that inferior agents will.

Factitious Airs and Medicated Vapours.—Considerable expectations were at first formed of the results to be obtained from the inhalation of factitious airs; but these have, for the most part, ended in disappointment. Reasoning from analogy, nothing would appear more likely than that a direct application to the seat of the disease must be as eminently serviceable as we find it to be in all cases of local affections. Since asthma, generally speaking, is more or less dependent on the morbid sensibility of the mucous membrane of the air-passages, the inspiring of gases or vapours appeared to offer both the substances and medium which would effect so desirable an end. Experience more frequently shows the fallacy of analogical reasoning than of any other; and has, in this instance particularly, destroyed all *à priori* conclusions. Those who first recommended these remedies are, as is usual with inventors and their immediate followers, loud in their praise. Fourcroy, Beddoes, Ferriar, and others give us cases in which, according to them, undoubted benefit has been derived; and Beddoes, speaking of oxygen, enthusiastically states that, "No sooner does it touch the lungs, than the livid colour of the countenance disappears, the laborious respiration ceases, and the functions of all the thoracic organs go on easily and pleasantly again."

The benefits to be derived from any factitious airs of themselves I regard as very problematical; but, when asthma has supervened to consumption, and especially when any trace of an unhealed cavity is discernible, inhalation itself is highly to be recommended, on the grounds I have laid down in my Treatise on Consumption, for the detail of which reference is made to that work. And for the relief of asthma itself, unconnected with phthisis, the mechanical effects of inhaling I have found of the greatest advantage.

Expectorants.—The various articles of the materia medica usually arranged under the head of expectorants have been, from time to time, much employed in the treatment of asthma, for the purpose of facilitating the elimination of any mucus accumulated in the bronchi, or retained in the glands that secrete it. The fœtid gums have been much extolled for their effects in this way; among these assafœtida, sagapenum, and galbanum have held a prominent place. In order to modify their heating qualities, a saline medicine may at times be prescribed: they are chiefly indicated in flaccid and phlegmatic habits. When squill is employed as an expectorant, it is often necessary to combine it with opium in order to qualify its inordinate action on the kidneys and intestinal mucous membrane. I have occasionally found patients complain, during the early part of the intermission, of uneasiness in the chest, arising from the presence of an adhesive viscid mucus, which seems to act like a valvular obstruction in some one or more of the bronchial tubes. The expulsion of this tenacious secretion may be promoted by some preparation of squill alone, or else united with ipecacuan. In patients of enfeebled habit and advanced age, the decoction of senega, taking care previously to its use to clear the primæ viæ by some gentle purgative, will be found of much service. The root itself will act as a general evacuant; since, when the decoction is judiciously apportioned, it increases the urinary and cuticular secretion, while at the same time it facilitates the discharge of mucus.

A gentleman, who had been previously under the care of Mr. Abernethy, applied to me some years ago, having suffered, he stated, for some time from asthma, and especially from sensations occurring in the intermission, and often indeed preceding the paroxysm. These were an arid and parched feeling, which extended throughout the whole of his lungs, and was accompanied by a sense of dryness in the nose, although not to the same extent. Mr. Abernethy had tried many remedies, but fruitlessly, for his relief; and he was on the eve of leaving me, after having attended me for a short time, when I bethought myself that the application of some irritating substance to the internal membrane which secretes the mucus of the nose, might, by continuous sympathy, extend its effects to the mucous glands of the bronchial tubes. With this intent, I directed him to use as a snuff the compound powder of Asarabacca, which is sometimes employed as a sternutatory. Fortunately this operated in the manner I had desired, but had scarcely ventured to anticipate. The natural secretion of the lungs was restored; and not only did the arid heat and other distressing symptoms attendant on its retention disappear, but he likewise recovered from the asthma.

Aperients.—I have already had occasion to mention the injurious effects likely to result from the exhibition of these medicines to any extent; and that the too great freedom given by their operation to the descent of the diaphragm, since the lungs cannot at once accommodate themselves to the emancipation thus suddenly given them, is apt to produce a reaction of the respiratory muscles. Unless the patient happen to be troubled with costiveness, it will be decidedly improper to interfere with the bowels; but, should there be any irregularity, this may be corrected by means of gentle laxatives, as rhubarb, magnesia, sulphur, or some aloetic compound, etc.

Appreciating the sound advice given by Withers regarding the importance of keeping up a due action of the intestines, I shall take the liberty of condensing his views on that matter. He observes that when the bowels are loaded, and particularly when the large ones are distended with flatulence and hardened fæces, the descent of the diaphragm in inspiration is prevented, a circumstance attended with no slight inconvenience. Hence it is that the administration of laxative and purgative medicines, when practised with judgment and the necessary precaution, has always proved most useful in asthma.

With this intention he recommends the common laxative and purgative remedies in various forms of combination. Warm aperient medicines, such as the compound rhubarb pill, the tincture of rhubarb, etc. —have been represented as valuable in this disease in persons of cold constitutions, and in whom the stomach and bowels are weak, irritable, and subject to be inflated with wind; whilst, in full and plethoric habits, the saline purgatives, from their cooling properties, have been found the safest and most applicable. In such cases, a mild purgative is given in preference to a laxative, inasmuch as it procures a more copious evacuation, contributes not a little towards diminishing the plethoric state of the vessels, and also on the principle of revulsion determines to the abdominal viscera.

Besides the uses just now ascribed to purgation, it is also considered to have the effect of promoting absorption. We must here, however, make one remark which the practitioner should not lose sight of, viz., that if purgatives can be employed with this intention, without doing more injury than they can remove or prevent, it must be in those forms of dyspnœa where the pulmonary exhalants are in a state of turgescence, and have not yet relieved themselves by allowing an escape of their serous contents.

We now come to consider the injurious effects of purgatives, and shall advert to them as briefly as possible. Purgatives, by the debility they produce, render the asthmatic patient more liable to a return of the paroxysm. This is in conformity with a well-known principle, that in persons of great sensibility, and where there is marked laxity of fibre, any cause which increases debility aggravates their state. Thus, then, the practitioner will be cautious when he employs purgation to recommend none other than the mildest.

The early writers (and I am sorry to say some of the moderns seem to follow their decisions,) are vehement advisers of copious evacuation. Ætius orders purges until blood is brought away, and lays it down as an axiom, "*The greatest remedy is strong purging by strong medicines.*" Bellonius says, "*In difficulty of breathing, frequent and great purging is not to be dreaded.*" The recommendation given by some modern writers to purge first, and then give opiates to counteract the ill effects of the drastic medicine, is on a par with the medical knowledge of their antique brethren. When the bowels are torpid, and the secretions vitiated, purgatives are of course necessary; but, when the alvine contents are only partially retained, it would be more advisable to remove them through the medium of enemas than of drastics, calculated to increase that irritable congestion of the mucous membrane of the bowels frequently observable in asthmatics.

Issues and Blisters.—When we consider the peculiar bias of the old humoral pathology, we cannot be surprised that the ancients had such frequent resort to issues. In their practice they always had in view the serous defluxions in this disorder, and endeavoured to interrupt them in their descent from the head. We have already mentioned that Ætius was so fully impressed with the utility of this practice, as to order several ulcers to be made and kept open at once between the head and the diaphragm. Dr. Bree considers that in the case of very old asthmatics issues are sometimes necessary; and that when the disease is not inveterate, they may prove serviceable by establishing derivation from the lungs, and affording a better opportunity for the operation of tonic remedies. The same experienced practitioner states, that in the case of young subjects he has directed issues to be healed up without the least inconvenience, and in some with considerable benefit. He found great relief to the breathing from their application to the thighs when the asthma became complicated with general dropsy. It has been a favourite tale with writers on asthma to tell of the benefit derived by William the Third from the running of the sore upon his shoulder, made by a cannon ball received at the battle of the Boyne, during the continuance of which he was free from any asthmatic attacks. From this it was conjectured that issues would produce the same results; and I have no doubt that this reasoning has caused hundreds of patients to be put to useless pain. In the case of this monarch, which would appear to have been a catarrhal asthma, the inflammation and the running of the sore diverted the undue determination of fluid from the chest, and consequently tended to prevent the recurrence of the paroxysm. Whenever, too, any established discharge or eruption has been driven in, or when asthma is complicated with gout, or any other morbid condition of the system, an issue may be beneficially resorted to; but issues, whatever influence they may possess on the complication, can exercise little or none over the disease itself.

Having alluded to the case of the above monarch, I may still further observe that he was troubled with an unusual quantity of rheum or phlegm, and it was to lessen this that Radcliffe directed his attention,—a successful practitioner, whose gold-headed cane, after having passed through the hands of several other physicians, who strove by its magic influence to attain the same celebrity without a tithe of his adroitness or tact, was a few years ago deposited in the library of the College of Physicians.

There are several states in which blisters may be applied with advantage to the patient; but I must say, that, in cases where they are ordinarily employed in the medical practice of this country, leeches would be better calculated to ensure the desired effect. When the lungs are œdematous, blisters are of course indicated; and in cases of inflammation it will be advisable to apply them, after depletion, to that side of the chest which is chiefly affected. They may be used as counter-irritants, to lessen inordinate secretion from the air-cells and bronchial membrane.

In elderly individuals I have known a pituitous discharge occur to such an extent as to threaten suffocation; and a patient of mine used to be troubled with a discharge of colourless, somewhat ropy, frothy fluid, excessive in quantity, coming on after the paroxysm; although, during its continuance, the expectoration had been but trifling. These cases, however, are far from common; yet, when they occur, the application of blisters will tend sensibly to relieve the oppressive sensations at the chest: they contract, by their stimulant power, the secerning orifices of the exhaling vessels of the mucous tissue, and reduce the morbid irritability of the mucous glands. In cases of venous congestion they impart a stimulus to the dilated vessels, endowing them with contractile energy, and thus restore the balance of the circulation.

The species of asthma which we are now considering, being chiefly a derangement of the nervous function, it may perhaps be worth while to try to counteract this by blistering largely; and if the patient be a severe sufferer from asthma, he will hardly object to the trial. My predecessor at the Infirmary, Dr. Buxton, entertained so high an opinion of the importance of blisters as a remedy, that he was in the habit of ordering them in almost every stage of disease of the lungs: however, as far as my own practice is concerned, I am not so liberal in their application: and of late years, when I do apply them, it is generally either to the top of the sternum or the front of the neck, after leeches have been previously applied to the same parts.

It has been stated that the application of tartar emetic ointment, for the purpose of producing artificial eruptions over the chest, has been attended with considerable benefit in the treatment of asthma. I must own, however, that I have never seen a single case in which it appeared to be productive of the least permanent good. The disfigurement of the chest occasioned by this practice is really so distressing, more especially in young females, that one cannot but feel surprised how medical men can recommend a remedy so very painful, and at the same time of such questionable expediency.

I have previously mentioned, when speaking of counter-irritants during the paroxysm, that to produce the greatest effect on the nervous system, they should be for the most part applied along the chain of the thoracic ganglia.

Antispasmodics.—We have already adverted to the use of the various antispasmodics, as employed during the paroxysm of asthma,—they have not been found of much advantage during the interval. Perhaps the only occasion on which they can prove serviceable is when, after a violent fit, some dyspnœa may still continue, which we know to happen very frequently. For the mode of their administration, the occasion when they should be employed, and the precautions to be observed in prescribing them, I beg leave to refer to what I have already said on the same subject, p. 107 *et seq.* The substances of this class most frequently ordered during the intervals are assafœtida, castor, musk, camphor, and valerian.

On the subject of Diaphoretics, and some other species of medicaments, which may sometimes be found beneficial in asthma, I shall not dwell, as the enumeration of all the classes of medicines which may occasionally prove serviceable in asthma, and the selection of which must be left to the tact and judgment of the practitioner, would be really endless.

Dietetic Treatment.—This must wholly depend on the constitution of the patient, and the diathesis to which he is chiefly inclined. Most asthmatics exhibit symptoms of dyspepsia, and according to the extent of these, their diet should be regulated. When free from indigestion, they are often found to labour under other complications to be taken into account when we lay down a plan of dietetic treatment. Were the asthma pure, (a condition seldom met with,) and dyspepsia conjoined with it, no better general rule could be given the patient than to abide by the hermit's fare—bread and water. But to be practically useful it is necessary to consider the prevailing states connected with asthma; and after the dyspeptic I have found the conditions which ordinarily predominate in the sanguineous and melancholic temperaments to be the most common. The regulation of the diet is too apt to be overlooked, and yet it is to the full as important as the medicinal treatment. Celsus truly observed, that "sanis omnia sana," every thing will agree with the healthy —and it might almost be asserted, that the converse of the proposition holds good with respect to the sick.

To begin with the dyspeptic—were I now considering indigestion as a separate disorder, apart from asthma, I should sum up my directions in very few words; or, perhaps, the most serviceable advice I could give the patient would be to eschew the treatises on the subject, which have of late years inundated the press—for many of them are delusive. Since it assumes, however, a different character, when in complication with asthma, and what might agree with the mere dyspeptic patient would, in many instances, induce a paroxysm were he also asthmatic, it becomes essential to enter rather at length on the subject. For example, there are dyspeptic ailments, the best cure for which would be liberal, and even high living. A hearty meat dinner, and a pint of wine is by no means the worst remedy which can be prescribed in some cases of dyspepsia; but it would be uniformly pregnant with distressing consequences, were the dyspeptic patient troubled with asthma. In the latter case, temperance in drink and abstemiousness in food, are the leading principles to be observed in point of diet. The difference of age will also form another guide in regulating the choice of food. When reduced in strength by the weight of years, a somewhat more generous mode of living is not only allowable, but called for. Animal food should be sparingly used by both young and old; but the latter may be indulged with a little brandy mixed with water, or wine if preferred, and occasionally sound, well-fermented table ale or beer; all which, but especially the last, should be carefully avoided by the young and strong. When dyspepsia exists to an excessive degree, it will be necessary to bring the patient to a farinaceous regimen, to which belong gruel, sago, rice, arrowroot, tapioca, &c.; and the drink must be water, either pure or with toast, and the less that is drunk the better. In less severe cases the average amount of animal food taken *per diem*, may be about six ounces; and if this quantity, eaten with stale bread, should be found to agree, it may be gradually increased to eight or ten. Vegetables, as tending to generate flatulence and other disagreeable symptoms, should be rarely, or rather, never indulged in. Regularity in the hours of meals is also of paramount importance; and the nearer these are arranged to the natural periods for eating, that is to the medium hours between the too early meal-times of the labourer, and the opposite extreme of the rich the better. By fixing eight for breakfast, two for dinner, and seven for tea, and by abstemiousness in each, proper time will be allowed for the process of digestion, and the appetite will come healthfully round to the appointed hours.

Temperance becomes, perhaps, a more positive virtue in asthma, than in any other disorder. Spare, simple, and regular diet assists powerfully in the preservation of the asthmatic's health; and consequently, irregularity and excess are equally as injurious. Nor is the good resulting from systematic plainness and abstemiousness, confined to their direct action on the bodily health generally; but, tending indirectly to equalize the temper, and preserve a quiet frame of mind, they operate beneficially by rendering the asthmatic less liable to that irritability of temper which so often concurs in inducing a fit. Hippocrates says, "If a man eats and drinks little, he shall have no disease;" and no observation has been more generally confirmed. The rule is equally applicable to each variety of the asthma, with one exception—the pituitous, in which a more generous mode of living may be allowed; and, indeed there are few patients who do not readily subscribe to its truth.

The reason for its observance in asthma is even more obvious than in most other chronic diseases; although it is of vital import in all derangement or disorder of the stomach, which is sometimes the cause, and is frequently the accompaniment of the asthmatic paroxysm, so that too much attention cannot be paid to this point. Every temptation to transgress the limits of temperance, either in food or drink, should be firmly opposed. A little moral courage will often prevent a world of suffering. Fortunately, too, we are so much the creatures of habit, that a short perseverance in dietetic sobriety will render a plain, and even limited regimen, as satisfactory as the daintiest edibles in the "Almanach des Gourmands."

The stomach of asthmatic patients being very often weak and relaxed, Dr. Withers, whose dietetic rules are valuable even in modern times, says that much care and attention are necessary. Symptoms of wind, indigestion, colic pains, heart-burn, costiveness, want of appetite, and many others which are attendant on general weakness, occur frequently in asthmatical cases.

The same writer gives some excellent precepts with respect to the diet and regimen. He recommends very strongly that the diet be light, easy of digestion, and without any high seasoning. Plain meats are the most proper, together with a moderate quantity of vegetables, when the stomach is able to digest them;—he also advises that this organ should never be overloaded at any one meal, as it interferes with the function of respiration, and occasions much distress. The use of fish he also considers as by no means improper, provided it be not too rich—more especially when it is eaten with relish and digested with ease. He firmly enjoins, that whatever creates flatulence and acidity ought to be carefully abstained from by persons of bad digestion. Vegetables in some cases disagree, particularly cabbages, cucumbers, cold salads, and such like. Bread, rice, good potatoes, asparagus, and artichokes, will be readily digested. Fruits should never be eaten on a full stomach, and hence desserts are very improper for asthmatics; ripe fruits, whether fresh or dried, taken on an empty stomach, are not to be forbidden when they do not interfere with digestion. When the stomach is so weak that fruits occasion wind or pain, they should be discontinued.

The same author recommends milk, and also goats' whey, in asthmatical cases: there are some persons, however, with whom milk does not agree in any form.

Malt liquors also, he says, are not improper, if the digestive organs are sufficiently healthy to bear them; but when the stomach is very feeble, all malt liquors are apt to create wind and acidities. Toast and water, either simply by itself, or with a little wine, may be taken. The moderate use of fermented liquors is necessary in asthmatical affections, when there is any gout in the constitution, or in persons debilitated by the disease, or advanced in years. In young and plethoric persons, a spare diet, without any strong liquors, is found to be best and safest. Acids, more especially the juice of oranges or lemons, often agree with the asthmatic patient: they may be taken with plain water, or with a little wine and water;—when the stomach is impaired, however, they often create acidities. Floyer, too, extols the use of acids and acescents in asthma, and goes so far even as to say that no asthma can be cured or prevented without them: they are most proper in summer.

The regimen to be observed by individuals of a sanguineous or inflammatory diathesis, is nearly akin to that laid down for dyspeptics. Both should be abstemious; but the latter ought to be so in the quality and quantity of food, the former for the most part in quantity. The dyspeptic should decline all made dishes, rich soups, ragouts, stews, and entremets of a thousand and one denominations; but of these, with a limitation in point of quantity, the asthmatic of a phlogistic habit may be permitted to partake, observing, however, that such dishes be not too highly seasoned. Stimulating liquors of every kind, from spirit to strong ale or beer, are likewise prohibited; but pickles, cheese, and other provocatives, from which the dyspeptic are to be debarred, may be allowed.

When the patient, without any assignable reason, labours under depression of spirits and general melancholy, the physician must endeavour to ascertain whether the mind or body has more share in producing this morbid temperament. Particular courses of study and habits of thought often exercise a great, but unsuspected influence on the constitution; and whatever calls for great mental exertion, or overexcites the feelings, will generate this condition of the mind. In these cases the thoughts must be diverted from their usual channel; and if severe study be the cause of ailment, the necessity of relaxation must be enforced. If a too acute sensibility brought by circumstances in contact with scenes of distress, or the indulgence of gloomy and melancholy ideas be the origin of the malady,—in other words, if the feelings so far preponderate over the judgment as to prey upon the health, the physician must become the Mentor of the patient, and appeal strongly to his sense of duty as a moral and responsible agent. Should this disposition have continued for any length of time, it can hardly have failed to produce injurious effects on the digestive apparatus, and medicine must be employed as an auxiliary to the diet. A due regulation of the latter, however, will, especially if conjoined with change of scene, effect much.

Should the patient have been a plain liver, and sparing in the use of food, he should be directed to improve his fare, and enjoy the social meal, of course in moderation.

A late celebrated statesman, when praying his mother as she advanced in years to renounce her "water from the spring," urged, in his own beautiful and affectionate style, that wine was the milk of age; and this expression will convey the reasoning which prompts my recommendation of a more generous mode of living in the present instance. Should the contrary, however, be the case, and high living, together with hard study or mental distemperature, have occasioned the atrabiliarian complexion, the converse will hold good. The banquet of the epicurean must be renounced for the spare diet of the disciple of the porch; and the patient must "eat to live, not live to eat."

When bodily indisposition is the sole cause of the melancholic temperament, as it may originate in many different ways, it is impossible, in a work like the present, to speak otherwise than in very general terms on the subject. To lessen excitement, or to excite to a healthy activity, will usually form the chief points requiring attention; and, so far as the diet is concerned, enough has been already said to give a broad view of the course to be pursued.

Directly the abatement of the fit permits it, moderate exercise is highly to be recommended; and, indeed, to this, as well, perhaps, as to the influence of change of air, is to be ascribed the benefit which Baglivi states he has known arise from following the plough. On the importance of exercise to the asthmatic, which, among its other beneficial effects, includes one entirely overlooked by Withers, namely, that of promoting the secretions in general, this writer gives the following advice with his usual good sense: —Its salutary effects on the constitution, as well in diminishing plethora as in removing irritability, and strengthening the system, are unquestionable. When it is duly proportioned to the strength of the constitution, and to the stage as well as the degree of the disease, it is truly valuable. Young persons in whom the affection is only commencing may, says this same physician, if they have no natural malformation of body which renders it unadvisable, use exercise freely, on foot or horseback, especially if they are fond of rural diversions—as farming, shooting, hunting, &c. Violent or severe exercise, however, is not to be recommended to persons advanced in years, of unwieldy habit of body, or of an emaciated frame, who have been long labouring under the disease in its complicated form: for such persons, gentle motion in a carriage, on horseback, or by sailing, is better than active exertion. Oppressing the lungs will have the effect of disturbing the freedom of respiration. Walking, however, where the patient is adequate to it, is not to be condemned as improper. On the importance of exercise in the intervals of the fits, Floyer says that they who take none soon become cachectic, lethargic, and dropsical, through too much serum, for want of perspiration and expectoration. Riding has been found of considerable benefit in promoting the latter. The regimen, clothing, and residence of the patient, together with the economy of his house, so far as it regards ventilation, and the arrangement of his bed-chamber, all form, as I have already at some length observed, important considerations in the practice to be pursued in the intervals. Medicine, it should be remembered, is not the only, nor does it of itself constitute the principal point to which attention is to be directed. Nor are the moral agents to be overlooked. The "*mens sana*" is no less influential, as regards the state of the body, than is the *corpus sanum* with respect to the condition of the mind. To remove the exciting causes, or to withdraw the patient out of the sphere of their influence, is one and the same thing; since it matters nothing with respect to disease, whether the mountain comes to Mahomet, or Mahomet goes to it.

It may probably appear out of place to dwell here on the necessity of avoiding the exciting or occasional causes, when we are considering the dietetic and regimenal rules to be observed by the asthmatic; it should be borne in mind, however, that the most effectual means of shunning these is by strict attention to diet and regimen. Such, indeed, is the importance which I attach to the avoiding the exciting causes of the paroxysms, that I hesitate not to append the precepts given by Withers on this subject. The necessity of avoiding these causes will appear still more manifest, if it be recollected that the more frequent the returns of the paroxysms are, the more strengthened and rooted does the disposition to them become. Thus, if it be ascertained that exposure to cold, moisture, or sudden changes of weather bring on the attack, the patient should carefully guard against these. Dust, also, and other fumes, and all peculiar smells, should be avoided, and any trade or profession which may expose him to such should be given up. Excesses of all kinds, whether in bleeding or purging, in bodily exertion or in eating or drinking, must be eschewed; as, in consequence of the debility thereby induced, they tend to bring on the fits. Intense application of mind, the depressing passions, the occasions of anger, must be sedulously avoided, as such things have been known to occasion a paroxysm. Walking against a strong wind also may bring on an asthmatic fit.

I deem it preferable to close my remarks on each of the forms of asthma with a single case, bearing explicitly on every prominent feature characteristic of each variety. Thus, such of my readers as are victims of this distressing malady may, by comparing their own symptoms with those recorded in each case, form a judgment as to the particular species of the disease under which they labour.

I proceed, therefore, to give a detailed account of one of the most interesting and clearly defined cases of spasmodic asthma that has ever fallen under my notice. The first part was taken down from the patient's own statement; and the latter, from the period of my being called in, is copied from my private memoranda.

CASE OF ESSENTIAL, OR NERVOUS ASTHMA.

J. C., aged 26, was seized some years ago, in the midst of summer, with oppressed breathing, accompanied by tightness at the chest, which first came on about two o'clock in the morning, awakening him suddenly, and forcing him instantaneously to assume an upright position. This state lasted about three hours, and then the fit left him no less suddenly than it had seized him. Attacks of a similar nature occurred at intervals of three or four weeks, and usually about the same early period of the morning. At first, notwithstanding the inconvenience he suffered for the time, so short was the duration of these fits, and from the exhaustion they occasioned so speedily did he fall into a welcome and refreshing sleep, that he could not reconcile himself to the supposition he was labouring under any serious disease. At the most, he merely regarded it as some temporary ailment, arising from no assignable cause, and which could not possibly have any consequences. It was only on the prolongation of one of these attacks until the evening that a medical man was summoned, who immediately pronounced it to be a case of convulsive asthma. The patient then called to mind the having heard his father say that he had been occasionally, in his younger days, subject to this disorder; and, on inquiry, he found that a grand-uncle of his had been a martyr to it. In fact, he was convinced, by what he could learn from the older branches of his family, that asthma might be traced for several generations in one or other of its members. No cause could be assigned by the patient for the appearance of the disease. He was not aware that he had contracted cold; and, as to living, he erred rather on the side of abstemiousness than intemperance.

On my questioning him closely, it appeared that, notwithstanding his circumstances were prosperous and even affluent, he had been, for a considerable time previously to his first seizure, under extreme depression of spirits. He could not, he told me, account for it; but so nervous and desponding did he become, that his rest used to be disturbed, and he would lie awake brooding over fancied reverses and mischances.

After the exhibition of medicine calculated to act powerfully on the urinary secretions, the paroxysm slowly left him; but for two or three days afterwards he felt a slight wheezing, and was inclined to flatulence. He was singularly careful, subsequently to this his first serious attack, to preserve himself from everything calculated to produce a relapse. He took every precaution, both in and out of the house, to avoid cold; but about ten days afterwards he was seized, according to himself, with an unaccountable drowsiness and pain in the head; his feet felt cold and clammy, and he experienced a great constriction of the throat. He was sensible in swallowing of some obstruction to the passage of solid food; and he was troubled with an unusual discharge of pale and almost colourless urine. Different medicines were administered; but, these proving inefficacious, it was at length proposed by his medical attendant that he should lose blood. He had never undergone the operation previously, and this circumstance most probably co-operated to produce the good effects that almost instantaneously followed. The unusual debility occasioned by two such severe paroxysms happening within so short a period, and some stricture and weight of his chest still continuing, and alarming him with an idea that the fit would soon return, he removed to a watering-place, under the impression that change of air would ward off the blow. Accordingly he repaired to Cheltenham, where he remained about two months. After he had been here two or three weeks, he began to follow the fashion of the place, and took the waters, in moderation however. At the expiration of his stay, he found himself restored to as good health as he had ever enjoyed; and, returning to London, he continued the whole winter without experiencing even the slightest tendency to a relapse. He began to entertain apprehensions on the approach of summer, having heard that warm weather was the most unfavourable season for persons afflicted with spasmodic asthma. His fears, however, proved groundless; and it was not until the ensuing spring that he underwent a return of the disorder, brought on, it would appear, by some unwonted exertion in running.

During the long interval of convalescence which he had enjoyed, he had become rather corpulent, and of a full habit of body; and this, coupled with the recollection of the benefit he had previously derived from bleeding, induced a wish on his part that the operation should be repeated. Accordingly, he not only lost blood from the arm, but had leeches applied to his chest. This treatment, conjoined with the exhibition of medicine, removed the attack, which, however, lingered longer than on the former occasion. It being inconvenient for him to quit London for any period, as he had done two years previously, he took lodgings a short distance from town, resolving to sleep, at least, in the country air. Still the uneasiness of his chest continued; and, although the paroxysm had subsided, its effects remained. He was troubled with a very painful constriction, and occasionally with somewhat impeded respiration, accompanied with slight cough, until at the end of the summer he experienced an attack; shortly after the removal of which, another of the severest kind seized him, lasting for forty-eight hours without intermission.

It was towards the close of this paroxysm that I first saw him. His face was bathed with perspiration, the countenance anxious, the breathing excessively laborious, and he was scarcely able to utter a word, speaking at intervals, and then only gasping out a monosyllable. He had assumed the attitude from which asthmatic sufferers usually experience relief, leaning forward, his face buried in his hands, which were supported by the elbows resting on the knees, and these again brought up towards the stomach, the patient's feet being placed on a stool. He appeared to be undergoing considerable pain in the head, since he made signs indicative of suffering there, as well as in the right side in the region of the liver. There seemed also, from the manner in which he moved his hand slowly around the abdomen, a pain arising from the flatulent distension of that part; and, although his position must have added to this, he was probably deterred from assuming any other by the fear of an increase of the laborious action, especially in the thoracic muscles. His mind, or rather memory, was evidently affected by pressure on the brain, caused by the want of a free return of blood from the head. He, in fact, laboured under temporary stupor; this state was also indicated by the vacancy at times apparent in his countenance. I ordered the feet, which were intensely cold, to be bathed in warm water, and hot flannels wrung out of the same element, to be applied for some time to his chest, both before and behind. About fifteen grains of jalap, with four of calomel, were given to relieve the bowels, which had been confined for two days. He drank plentifully of sub-tepid water slightly acidulated with vinegar, and the severity of the attack subsided gradually through this treatment, even previously to the operation of the medicine. His cough became easier, the expectoration free and abundant, and he discharged quantities of a viscous substance, not unlike the white of an egg. As soon as the bowels had been freely opened, he was allowed to take coffee by way of refreshment. A slight febrile state being still observable a few hours after, I directed him to take a mixture composed of nitre, magnesia, and chalk, the former for its diuretic properties, and the latter for their antacid and absorbent qualities. About twenty grains of nitre, with ten of magnesia, and treble this of chalk were ordered to be taken at intervals. Finding that the recovery proceeded very slowly, and that pulmonary congestion continued to exist, I prescribed the application of leeches to the chest; and half-a-dozen grains of the compound squill pill, combined with three of blue pill, and a grain of ipecacuan to be taken night and morning for five or six days. I likewise laid it down as a general rule to be observed by him, that as often as the catarrhal affection returned, he should apply leeches as before, and take draughts composed of nitre, and a small quantity of tartarized antimony, keeping himself within doors. By perseverance in this plan, he entirely lost the catarrh, which, in the first instance, had probably originated in the irritation caused by repeated attacks of his complaint. The constant wear and exhaustion resulting from such continued illness, produced nervous irritability, which rendered him impatient of control; and, disregarding prudential considerations, he began, as soon as his amended health would permit, to give into excesses of living that he had never before indulged in. The consequence of this imprudence was, as I had too truly anticipated and warned him, dyspepsia, which, after some months, brought in its train a recurrence of the spasmodic asthma. My own urgent solicitations, conjoined with the recollection of his former sufferings from this terrible disorder, inclined him to caution, and he returned to his former moderate diet. My aim now was, since the catarrhal affection had been removed, to counteract the danger of the asthma becoming habitual, by striving to arrest its progress. I therefore directed him, immediately the symptoms of an attack became apparent, to take at one time an emetic, at another to try an enema composed of turpentine or tobacco; or, according to circumstances, to endeavour to stop the coming fit by a dose of tincture of opium. When, notwithstanding these precautions, the fit would supervene, leeches were applied to the chest, anti-spasmodics exhibited internally, and a system of soothing treatment unremittingly pursued. In lapse of time, the continuance of this active opposition to the attacks on the eve of their approach, and their prompt removal when they did come on, by the local abstraction of blood and other timely measures, effectually succeeded in removing the spasmodic diathesis, and restored the patient to a sounder state of health than he had ever enjoyed. As the paroxysms became milder and less frequent, the patient commenced in the intermissions a course of treatment calculated to preserve him from susceptibility to fresh attacks, proceeding by degrees from the sponging of his chest with tepid water and vinegar, to the use of the shower-bath. Either this or the common cold-bath was, at the period he left my hands cured, constantly used by him.

I should mention that, towards the completion of his cure, I advised him to have an issue on each side of the spine, beneath the lower angles of the shoulder-blades, made in a manner I had seen many years ago successfully practised in other disorders, during a stay of several months in the south of France. This is simply done by placing a piece of the bark of the mezereon, commonly called in that country *bois saint*, about three-quarters of an inch long and half an inch broad, on the part selected for the seat of the issue, and covering it with an ivy leaf. The slight irritation caused by the acrimony of this wood, or, more properly speaking, its inner bark, produces a salutary discharge, and this with infinitely less pain and trouble than any other species of issue. It is necessary to change it daily, unless the discharge is too profuse; in which case the same piece, after washing it, may be continued for two or three days. I must own, however, that I was induced to recommend this less from my own conviction of its use than from the authority and usage of some French practitioners, whom I saw employ it.

On a review of this case, it will be found that the first point to be gained, after I was called in to the patient, was the removal of the catarrhal complication. Having effected this, the most important consideration remaining was to combat the spasmodic dyspnœa, and counteract the danger of its becoming habitual.

At the period when this person case came under my care, I had not extended the employment of mechanical respiration to the treatment of convulsive asthma. My experience since, however, has decided me in recommending the practice of inhalation in almost every case of this disease. In fact, I have derived such marked benefit from the process in every variety and form of the affection, that I feel no hesitation whatever in asserting that the good obtainable from the use of internal medicaments is almost trivial, compared with the extraordinary services to be derived from inhaling. Of this fact, several medical friends have been witnesses, both in my infirmary and also in my private practice. Further details, and more especially the *modus operandi* of this *novum organon*, will be given in another portion of the work. I may state, however, in a general way that the salutary effects flowing from the use of the tube in asthma depend on the same principle as in phthisis. In both these diseases the healthy balance between inspiration and expiration is lost: it is for its efficacy in restoring this lost equilibrium that the practice of inhalation is now recommended.

ASTHMA,

COMPLICATED, AND SYMPTOMATIC.

CATARRHAL ASTHMA.

Having considered the subject of idiopathic, nervous, or essential asthma at considerable length, and having observed that this is the most uncommon form under which asthmatic disease presents itself, we shall now enter on the examination of that variety of asthma, much more frequent in its occurrence, and in which the several phenomena or symptoms of the affection are but the effects of some other internal disease. By reason of the extended sympathy which exists between the respiratory apparatus and the other parts of the system, the organic changes capable of giving rise to the group of symptoms which constitute asthma have been represented as very numerous. Whilst I readily admit the extent of this sympathy, I am inclined to think, that in some instances, at least, the increased number of morbid alterations, now looked on as the material causes of asthma, is owing in some measure to the abusive application to pathology of the discoveries recently made in pathological anatomy. With all the advantages we thus possess in our augmented knowledge of morbid anatomy, and in our extended acquaintance with physiology and pathology, we are still unable in many cases to trace the connexion supposed to exist between these organic changes and the asthmatic symptoms. Why a pleuritic effusion — a cerebral abscess — a tumour on the course of a nerve, should produce an asthmatic paroxysm, we know not; why such an assemblage of symptoms should become developed in one man labouring under a hypertrophied heart, in another person suffering from chronic bronchitis, we probably never shall be able to explain: in other words, the rationale of the symptoms during life will fail to be discoverable in too many instances by the closest inspection of the lesions found after death. This, however, cannot be taken up as an argument against the use of autopsic examination of the dead body. The most positive, practical, and satisfactory part of our medical knowledge has unquestionably been derived from the cultivation of pathological anatomy.

We shall now proceed to enumerate the internal or other lesions or states capable of producing the symptoms of asthma: among the first of these we shall notice enlargement of the tonsils. The salutary effects of this pathological state in arresting the progress of pulmonary consumption has been pointed out in my work, specifically devoted to the discussion of the nature and treatment of that disease. Another condition, capable of exciting the phenomena of symptomatic asthma, is congenital narrowing of the isthmus faucium. The mode in which these two states now mentioned act in producing asthma appears to be precisely similar, viz., by retarding the exspiration. Soldering of the ribs, by ossification of their cartilages, is another state capable of occasioning this affection. To these causes we may add various malformations of the chest, pleuritic effusion, adhesions between the pleuræ, the presence of certain bodies in the interior of the respiratory apparatus—as, for instance, of bronchial or nasal polypi, tumefactions of the glottis, œdematous or otherwise. According to Laennec, chronic pulmonary catarrh is the most common cause of asthma: the thickening of the bronchial mucous membrane, which is the consequence of this disease, as also the narrowing of the canals lined by this membrane, obstruction or simple compression of the larynx, trachea, or bronchi by any cause, pulmonary tubercles, vomicæ, œdema of the lung, and emphysema as stated by Baillie and Laennec, hypertrophy of the thymus gland. To this last we shall again advert.

Lesions of the circulatory organs, occasioning the development of asthma.—Various affections of the pericardium, as well as of the aorta, diseases of the valves and of the coronary arteries, in a word, all affections of the heart, and more particularly of the right cavities. Another disorder capable of inducing symptomatic asthma, and one which has not been much noticed, is enlargement of the liver. That such a state may produce considerable difficulty of breathing, by interfering with the functions of the diaphragm from the great weight of the liver, is not at all improbable. Another effect of enlarged, and consequently obstructed liver, will be that in such cases the vena azygos is obliged to carry more than its normal quantity of blood to the thorax, the effect of which will be to cause congestion of the bronchial veins; and hence difficulty of breathing.

Asthma has been described by Dr. Chapman of Philadelphia to be a bronchial spasm, induced by irritation generally of the pneumo-gastric nerve, and sometimes of the spinal and ganglionic nerves. He recommends practitioners to direct closer attention to the influence of spinal irritations in the production of the disease. He has so repeatedly seen cases having unequivocally a location in the upper portion of the vertebral column, that he is satisfied of its being a more common origin of it than heretofore suspected.

We have now noticed all the material lesions which pathological anatomy discovers in the dead body of asthmatics: there are some few other lesions, which we shall now notice. The different species of bronchitis may give rise to intermittent dyspnœa. According to M. Andral, " there are some individuals who ordinarily do not present any sign of bronchitis; who do not cough, have no shortness of breath, and who at certain intervals are seized suddenly with the following symptoms; extreme oppression, imminent suffocation, purple colour of the face, as in asphyxiated persons, pulse small and contracted, rather frequent, cough dry at first, then accompanied with profuse expectoration. These different symptoms present themselves suddenly; they acquire very rapidly their extreme degree of intensity, they then diminish; and, after a few days, they are gone, without leaving any traces behind them."—Clin. Med. M. Andral explains the appearance of these symptoms by the sudden engorgement of the laryngeal and bronchial mucous membrane. The palpitation complained of by the patients takes place only when the dyspnœa has become very intense; the symptoms, therefore, cannot be referred to them, as they are consecutive to the disturbed respiration. To this form M. Andral proposes to give the name of bronchial asthma: it is distinguished from the other bronchial affections by the intermission between the fits being more marked and decided, and there being none of the signs of mucous inflammation observable in the intervals.

In emphysema, which has been considered one of the material causes of symptomatic asthma, the difficulty of breathing is constant, and increases only at intervals; moreover, the extreme sonorousness of the thoracic walls, the diminution of the respiratory murmur in the points where the chest sounds most, the change in the conformation of the thorax, which is now more rounded, will assist in recognizing symptomatic asthma.

Having now passed in review the chief causes which are supposed to produce the disease, it may be worth while to inquire whether they all act in the same way. Diseases of the heart, as hypertrophy, pulmonary tubercles, pleuritic effusions, are so many obstacles to the free passage of the blood through the heart and lungs; now, it is clear, that if the hyperæmia of the lung be such that the whole of the black blood cannot be oxygenated, this flood must come into the arteries of the brain incompletely decarbonized, and will occasion a commencing asphyxia. There then occurs something like what happens when black blood is injected into the carotid arteries of an animal: the breathing becomes hurried and anxious, and symptoms almost similar to those of asthma are observed to take place. In case of asthmatic suffocation, whether the venous blood passes into the arteries, according to Bichât's theory of asphyxia, is a question as yet undecided, and one on which, for obvious reasons, I shall not dwell.

A variety of affections of the bronchial membrane, permanent as well as constantly recurring from the ingression of cold, may be referred to the general head of "Asthma complicated with catarrh." I use the term catarrh in its perverted, but now general sense of a particular affection of the mucous surface of the bronchi, whether or not accompanied by inordinate secretion; and I think it preferable to that of bronchitis, inasmuch as (although a faulty expression) it admits of a wider range. The ancients classed under the term κατάῤῥος those cases which were subsequently known as defluxions from the lungs, as well as several acute disorders of a catarrhal form, which, as we collect from Hippocrates, soon terminated fatally: his phrase is κατάῤῥοι συντόμως ἀπόλλυντες. The structure and office of the bronchi render them liable to be easily affected by atmospheric changes. Their numerous ramifications present a great extent of surface to the action of the air; and this action is, of course, incessant, from their very function of supplying the lungs. The peculiar characters which catarrhal affections assume are, in a great degree, occasioned by difference of constitution and habit. A little care will suffice to preserve some from any great inconvenience resulting from catarrhal complaints; while the most watchful attention will never save others from constant aggressions. Again, the symptoms are peculiarly modified by the age, calling, and physical habit of the individual.

The humoral form of this species of asthma occasionally supervenes on the essential variety; and, on the other hand, is not unfrequently its precursor. Persons of advanced age are more subject to it than the young, although it is by no means of rare occurrence at an early period of life. A marked difference between this and the spasmodic form consists in the state of the patient during the intervals, which, in the humoral asthma, produce comparatively little ease. The air vesicles are kept in a state of constant irritability by the mucus accumulated within them; and it is not until after several attacks, of a duration more or less severe, that the cough and expectoration become easier and more free. The ingression of this variety is usually slow, and the symptoms gradually increase in intensity. The attack after the first partial subsidence, and after a state of imperfect ease during the day, recommences on the approach of night. A remission of the more violent symptoms usually takes place after a short time; but, sometimes, attacks of uniform severity will continue for a period of many days.

A disordered state of the stomach and bowels has been already noticed as a frequent concomitant of asthma. The patient is, in this form, generally distressed by flatulence, griping pains, and irregularities of the bowels: loss of rest, and, when sleep is obtained, its broken and unrefreshing character contribute likewise to harass the sufferer. A slight degree of fever is not an infrequent accompaniment of the humoral asthma. The amount of expectoration is at all times considerable, and occasionally surprisingly so. Patients have been known to expectorate from half a pound to a pound or more in the course of a few hours. In many cases there is found a great regularity in the recurrence of the paroxysms. They will take place for a considerable time towards nightfall, or more generally on waking from sleep, and come on with much exactness.

Bree mentions a singular instance of a patient's being attacked, when in perfect health, with a paroxysm which continued a few hours, and which returned in precisely the same manner after an interval of six months.

When the disease has existed long, dyspnœa becomes habitual; and when the constitution has been impaired by excesses, or long-continued and close application of a sedentary nature, it assumes that form which may be termed chronic pituitous catarrh. The blood then becomes thinner, a lymphatic state of the system supervenes, the frame is attenuated, and the countenance is usually extremely pale. After improving in health, the individual who has been subject to the pituitous catarrh, will sometimes have the disorder changed to the chronic mucous catarrh; and the same circumstance will also happen on the change from the cold of winter to the milder temperature of spring. Again, should the health of a patient affected with chronic mucous catarrh become deteriorated, the above affection will degenerate into chronic pituitous catarrh. This is most frequently the case with females.

I have just stated that the different species of bronchitis may give rise to intermittent dyspnœa; which, when it attains a certain degree of severity, acquires the rank and obtains the designation of asthma. The various forms of catarrh, also, are acknowledged by all pathologists to be frequent exciting causes of asthmatic disease. When we consider the pathological state of the respiratory mucous membrane, existing in these several forms of catarrhal disorder, it will appear that the manner in which they produce the asthmatic paroxysms is by their immediately occasioning an incomplete decarbonization of the blood, and that feeling of want of breath, called by Laennec *le bésoin de respirer.* The chief varieties of catarrh which give rise to asthmatic phenomena are, 1. the chronic pituitous, 2. the chronic mucous, and 3. the chronic dry catarrh.

Chronic pituitous catarrh.—This is characterized by a watery, occasionally transparent, and somewhat ropy expectoration, often mixed with slightly yellow particles. There is froth on its surface; and, after the removal of this, the residue has been compared to white of egg diluted with water.

Such expectoration is chiefly observed in persons who have been long affected with thoracic disease;

and who, on the setting in of winter, have the secretion of the skin considerably checked, and this excretory itself habitually cold. It has been observed, also, in the resolution of pneumonia, more particularly when too much depletion has been employed, and also in œdema of the lung. It may accompany the acute or chronic form of the disease: with the latter we are more particularly concerned.

The chronic pituitous catarrh, which is generally a sequela of the other catarrhal varieties, ordinarily attacks persons who have passed the meridian of life; whose constitutions have been more or less impaired by other diseases, or by irregularities of various kinds. The signs are, the aqueous expectoration already mentioned; the chest sonorous, except where there exists any solidification or adhesion, the result of previous tubercular disease: the respiratory murmur varies according to the duration or intensity of the affection; the expiratory murmur is however more or less prolonged. The respiration, as well as the cough, according to Laennec, is accompanied by a sonorous râle of a grave or sibilant character, at one time imitating the chirping of birds, at other times the cooing of a dove. A mucous râle is often conjoined with it. This variety of catarrh seldom comes on suddenly; it generally developes itself by slow degrees after several attacks of acute dry or mucous catarrh. When the disease is firmly established, it often observes intermissions more or less regular. The paroxysm ordinarily takes place early in the morning, in consequence of phlegm accumulating during the hours of sleep; and again in the evening, by reason of the acknowledged tendency observable in most diseases to become aggravated towards that period. In some persons, distension of the stomach after a meal induces a paroxysm, by the interference with the action of the diaphragm. Individuals affected with this disease are, in general, of a delicate and spare habit; and, in cases where the patient was originally plethoric and robust, he is reduced to a meagre and emaciated condition by the long-continued drain on the constitution. I may further observe that, as in all cases of catarrh of long standing, the trachea is at length affected; it becomes much contracted, and disproportioned to the size of the lungs, which have now attained both a positively and relatively increased volume. From this stage may be dated the period when the individual is set down as a regular asthmatic. With the progress of age, the duration and frequency of the paroxysms are observed to increase. The chief anatomical character of this affection is passive or venous congestion of the mucous membrane of the bronchi.

Chronic mucous catarrh.—In applying the epithet "mucous" to this form of catarrh, there appears a certain degree of incorrectness, inasmuch as the expectoration, so far from being of a mucous nature, frequently corresponds to that observed in tubercular phthisis; being, in fact, of a decidedly purulent character. The expectoration of a phthisical patient with a cavity in his lung, and in whom no liquefaction may be going on at the time, may be precisely similar in every respect to that which occurs in the form of disease now under consideration. Laennec does not appear at all aware that the great majority of those cases of chronic mucous catarrh are, in reality, instances of arrested consumption, in which the catarrhal affection has supervened on the primary phthisical disease. *En passant*, I think it right again to advert to Laennec's error in saying that chronic mucous catarrh is occasionally accompanied with night sweats. Such sweats, when they do occur, both in this and in the convalescence from some other diseases, depend on the existence of tubercular liquefaction, and have no connection whatever with the mere catarrh. Of the truth of this pathological principle, I have been fully convinced by years of patient and untiring research at the public institution with which I have been so long connected, as well as in an extensive private practice. Of the advantages which must necessarily present themselves under such circumstances, I have been always careful to avail myself; and, by attentively watching the progress of disease during life, and by autopsic examination, I arrived at the conclusions above stated.

In chronic mucous catarrh, the expectoration, as I have just remarked, oftentimes bears no little resemblance to that which accompanies consumption. It is, at times, of a singularly fetid quality, and occasionally exhibits traces of blood. It is true that in this, as well as in the other varieties of asthma, sanguineous expectoration may occur; but this circumstance usually arises from the presence of vomicæ in latent consumptive cases, on which catarrh in one form or other has fortunately supervened.

In some individuals subject to this species of catarrh, each fresh ingression of cold will induce the asthmatic paroxysm. The fit may, in such case, be owing to a congested state of the respiratory mucous surface, disposing to the spasm. The dyspnœa will in others be increased, yet not to such extent as to deserve the name of asthma; that is, the difficulty of breathing will be unaccompanied by any well-marked spasmodic affection. It is by no means uncommon to find individuals subject to chronic mucous catarrh display, on a fresh attack of cold, all the symptoms of asthma, whereas they are in reality labouring under latent pneumonia. The diminished capacity of the lungs for the purposes of respiration, which is the result of this last-mentioned condition, gives rise to the apparent asthmatic complication. Owing to an interruption from accumulated sputa to the passage of air to the inferior part of the lungs, and at times from the mucous râle being so loud as to mask the smaller unctuous râles characteristic of pneumonia, the presence of the latter passes unheeded. Hence, the patient being treated as if the disease were asthma, becomes more and more a prey to the inflammation, until at times he finally succumbs.

A singular circumstance connected with this, as well as other varieties of chronic catarrh, is, that in consequence of the voluminous and emphysematous state of the lungs produced by their ingression, the patient is neither so liable to pneumonia as those who have never been troubled with any catarrhal affection; nor, when attacked, does the inflammation make such rapid progress, or spread to the same extent through the lungs.

Dr. Beddoes, who published a work on pulmonary consumption in the year 1799, has embodied in it a series of what may be termed medical statistics, replete with particulars of the highest interest, but from which he drew very unsatisfactory conclusions; neither has any succeeding medical writer, to my knowledge, deduced from them the highly valuable and almost evident principles to which they lead. The manner in which he commenced his investigations is deserving of the highest praise. He both collected himself, and sought through the observations of others, the ratio in which persons of different trades and professions are subject to various disorders. From these united researches, it appears that those classes which are most subject to catarrhs, and all the diseases arising from cold, are the most free from consumption. This fact is particularly exemplified in the case of the Scottish fish-wives, who, in all kinds of weather, cold, wet, warm, or dry, are in the habit of carrying heavy loads of fish on their backs for long distances, and with excessive rapidity. At times thus laden, a general race will take place in order first to gain the market for the highest price.

The value of exercise, on which I have so strongly insisted in my Treàtise on Consumption, cannot be more strikingly illustrated. These women are subject to excessive toil, exposure to every kind of weather, and, in short, liable to all those peculiar circumstances which are usually conceived most likely to generate consumption: yet, from the concurrent testimony of many medical men resident on the coast, and well acquainted with the class, the disease is almost unknown amongst them. The inquiries instituted amongst sailors and watermen, and especially amongst that hard-worked but stalwart generation, the keelmen of Newcastle-upon-Tyne, furnish the like results. Catarrhs are common; consumption rarely met with.

A very strong fact, confirmatory of what I have advanced in the same work as to the production of phthisis by the deterioration of the general health, is the circumstance that when consumption and tubercular liquefaction occur in sea-faring people, such occurrence is almost invariably the result of impaired health produced in the first instance by falls, bruises, strains, &c., received in the exercise of their calling.

In this work of Dr. Beddoes, butchers, proverbially a strong and active race, are stated to furnish the same exception; and the cause of this is by themselves attributed to the "smell of the meat." The same vulgar belief may be observed in the common idea that following the plough is beneficial in consumption, on account of the odour of the freshly turned earth. A moment's reflection on the startling concurrence of these circumstances will, I think, convince the most sceptical, that the origin of immunity from consumption enjoyed by all these classes is mainly attributable to exercise; that the primeval curse, "the sweat of the brow," is to them a blessing.

Some curious observations are made by a correspondent of Dr. Beddoes, regarding the gentry in the north-west of Ireland. The fathers of these country squires are represented as reaching the age of seventy and upwards, even to extreme old age, without having suffered a week's ill-health in the course of their lives. This is justly attributed by the said correspondent to the active exercise which these individuals had been in the habit of taking; who, "either from business or pleasure, were accustomed to spend almost every day in the open air and on horseback."

So far the writer is correct in his views; but when he proceeds to attribute the shortened lives and premature decline of their immediate descendants to the fatal consequences entailed upon them by the intemperate habits of their fathers, he seems to me to err quite as strangely as he was previously correct. The indolent and sedentary life, which he imputes to these "degenerate offspring," was undoubtedly the true cause of the marked difference in their constitutions.

The branch of my subject which I am now considering has led me insensibly to this seeming digression. It has been seen that those classes who take most exercise, or who are most liable to catarrhal complaints, are, generally speaking, secure from the ravages of phthisis.

To recur to that exposed and amphibious race, the "fish-wives:" they are stated, in the work to which I have made such frequent allusion, to die frequently of peripneumonia notha. Thus we find the catarrhal state a protective against the phthisical; and, far from declining strength inducing the latter, so efficacious is the emphysematous state brought on, that failing health, together with frequency of colds, terminates in this aggravated asthmatic condition.

If any apology be requisite for thus wandering from the strict limits of my subject, I offer it in the words of Dr. Beddoes: "the prevention of pulmonary consumption and its cure may be numbered among the things most wanting to our system of life."

Having mentioned the chronic pituitous and chronic mucous catarrhs, I now proceed to that very common variety of catarrhal affections, combined with the asthmatic spasm, termed by Laennec dry catarrh. The expression "dry catarrh" is certainly a contradictory one, inasmuch as the derivation of the latter word implies, as we have already seen, a flux, or flowing; but, since it has been generally received, it is not worth while to cavil at the phrase. It thus serves as a general head, under which to range those inflammatory conditions of the bronchi, which are either without expectoration, or in which it exists in a very slight degree. The anatomical character of this species of catarrh is swelling of the mucous membrane, more particularly visible in the smaller branches of the bronchi. The colour of the above membrane affords another distinctive mark, being an imperfect or dark red, approaching to violet.

This disease is sometimes, and, for a short period, latent in continued fevers; is of frequent occurrence in the chronic form, and, in its acute state, generally accompanies the beginning and end of common colds.

Dry catarrh.—The dry catarrh exhibits, according to its extent, very various symptoms. When the cough and dyspnœa are considerable, the paroxysms approach to the pure asthma; and at the conclusion of the fits, tough, dense mucus, of a pearl-grey colour, is expectorated in globules. On the supervention of an acute catarrh, the dyspnœa is usually much aggravated. When it occurs in its lightest form, the only inconvenience felt is shortness of breath perceptible on exertion, with slight expectoration in the morning of mucus, having the colour and consistency described above. The disease is most observable in persons who have evinced the symptoms of phthisis in a mild degree in the winter, and recovered by the supervention of a common catarrh; which, in consequence of the coming on of the fine weather, and the consequent restoration of the cutaneous functions, eventually assumes the dry form; it is noticed also in gouty subjects, in individuals injured by excesses, and those troubled with cutaneous eruptions. They who reside in damp situations, or bleak parts of the coast, are also commonly affected by it.

It is worthy of note, that those persons who labour under chronic dry catarrh seldom lapsing into any pituitous complication, are usually, in every other respect, in rather good health, whereas the contrary happens in the other forms of catarrh: this difference I attribute to the absence in the former of any secretion exhausting the bodily strength.

Nothing can be more variable than the pathognomonic signs of this affection, owing to the constant mutations of congestion in the mucous membrane. Thus, in consequence of sputa changing place, the sounds perceptible on auscultation likewise change their locality. Accordingly, we find upon dissection that, at times, such a swelling of the internal membrane of some of the larger bronchi will exist, as almost entirely to prevent the passage of air. At times, it so happens that the disease exists in one lung only. This, for example, will occur when the patient having tubercles in the said lung, or a vomica having formed, some bronchial irritation has supervened, the neglect of which has occasioned this last affection to pass through other catarrhal varieties into the chronic dry catarrh, rendering the lung generally emphysematous, and thus in many instances arresting the progress of phthisis.

I have long observed, in cases of mal-formation of one side of the chest, as well as in individuals who have suffered severe attacks of pleurisy, or of peripneumony of some duration confined to one lung, that the opposite one is oftentimes increased in volume, and the patient ultimately becomes subject to dry catarrh. Under any circumstances producing increased mucous secretion of the air passages, or spasm or congestion of the same tubes, the result will ordinarily be this enlargement: in order to overcome such spasm, a convulsive action of the respiratory muscles takes place, thus exhibiting the phenomena of asthma.

The peculiar condition of the bronchial membrane, its structural alteration, and preternatural sensibility are, as has been seen above, a remote cause of the spasm; and the habitual state of disorder existing in it is, I have little doubt, frequently aggravated and called into action by cold, or some other influential agent.

The thorax is habitually unequal, and irregular in its movements. The inspiration is short and quick, but the expiration takes place by degrees, as it were, being slow and incomplete. When emphysema is considerable, and of old date, an expansion of the intercostal spaces is effected, and the thorax becomes prominent. If the affection is single, one side is rounded; if double, both.

Having now noticed the three varieties of catarrhal asthma, dependent on a morbid state of the mucous membrane, I proceed to the consideration of a case of asthma mentioned by Dr. Parry, which, from its sudden termination, has been named acute or congestive asthma. He relates, in his "Elements of Pathology," that an individual died in the space of fifteen or twenty minutes, with every symptom of spasmodic asthma, without having experienced any previous disorder of the chest. There was exhibited, according to him, complete suffusion of a damask-rose colour, amounting in some places almost to blackness of the entire mucous membrane of the trachea, and of all the ramifications of the bronchi. There seems to have been a want either of minute investigation into the post-mortem appearances exhibited by the subject of the above case, or of that previous pathological knowledge which would have rendered such an investigation available. From my own experience in autopsic examinations, (and I have had a very long and extensive one,) I think it probable that Dr. Parry overlooked some lesion of the heart, or even of the lungs themselves, and that the appearances described did not arise from the sensible mucous membrane alone. Congestion, at all events, is by no means a necessary accident in such cases. Wichmann states that he has seen an instance of acute asthma terminating in death; and that he did not observe, on opening the body, any alteration, either in the trachea or the lungs. I have to make the same observation on this case as on the former —some lesion most probably existed, but escaped notice; and if I may offer a conjecture on the cause of death in such cases, where no material lesion presents itself sufficient to account for it, I would say that the patient becomes asphyxiated by the retained carbonic acid gas with which the emphysematous portions of the lungs become very much distended, and which thus acts as a poison.

I have already alluded but cursorily to that form which goes under the name of Millar's asthma. Guersent, in the Dictionnaire de Médecine, seems to have entertained the same opinions as myself respecting the futility of Millar's views, and his unfitness for pathological inquiries. He states that "*la description de Millar est accompagnée de trois observations particulières; l'une d'elles est absolument insignifiante.*" The professor would not perhaps have been so severe, had he been aware that, until a very recent date, medico-pathological investigation had met with little countenance in this country. Guersent conceives that Millar, and those subsequent writers who have acquiesced in his reasonings, have confounded, under the general name of acute asthma of children, three or four different maladies. He further observes, that Millar seems to have had in view a peculiar disorder different from croup, and which he designates by the name of false croup. It is a very just remark of the same author, that "a great number of observations prove remittent or intermittent dyspnœas to be most generally, both in childhood as well as other ages, among the symptomatic effects of different inflammations of the organs of respiration, of œdema, or emphysema of the lungs, or one of the effects of any lesion of the organs of digestion."

In summing up his remarks on acute asthma, Guersent states that he has never recognised any organic lesion which could induce him to suppose the dyspnœa to have been purely symptomatic: my own experience leads me to very contrary views. Before concluding my observations on complicated asthma, I shall probably have occasion to give some reasons for this difference of opinion.

Having considered the ordinary symptoms of those catarrhal diseases, which are sometimes known under the designation of habitual asthma, I proceed to develope a plan of treatment for each variety, in the order in which I have already arranged them: and I may here at once state it as my opinion, that every variety of catarrh deserves the name of asthma as soon as the lungs become emphysematous.

Of all others, the catarrhal varieties of asthma, in consequence of the extreme sensibility of the mucous membrane of the lungs, are most liable to renewal and exacerbation from the ingression of cold; hence the treatment must be chiefly directed to restore this membrane to its natural condition. In the pituitous form connected with asthma, with a view to diminish the inordinate secretion of sero-mucous matter in the lungs, the superabundance of which in many instances threatens existence itself, and is, I am satisfied, one of the principal causes of the great pulmonary distress observed, I am a strong advocate for the immediate application of counter-irritants. A blister applied to the upper part of the chest, and after being suffered to remain on for three or four hours, successively removed and placed over three or four other parts for the same space of time, will be found beneficial; and in some cases, where the symptoms are urgent, and the aggravation of the pituitous state is considerable, small poultices, composed of mustard and linseed-meal, will act more speedily. The spirit of mindererus and camphor mixture, to the extent of half an ounce each, with some ethereal spirit administered at short intervals, will excite the skin and kidneys, and thus lessen the catarrhal flux. Whatever will promote universal warmth, and act derivatively from the chest by inducing perspiration, will be found to abate the undue secretion, which operates as a foreign substance in exciting unnatural movements of the chest; as, for instance, the foot-bath, warm demulcent drinks, and a well-regulated temperature.

There is no form of pulmonary disease in which I have found attention to this latter point of such paramount importance. The old Infirmary for diseases of the lungs, which, by the bye, was preferable in every respect to the present, had its temperature so regulated by night as well as day, during the winter and spring quarters, as to approach, by means of a clumsy contrivance, the heat of summer: and my experience here has shown me that this equable warmth, when properly adjusted, acts almost as a specific in this complaint.

Patients, whom I had received almost immediately from hospitals unrelieved, quickly became convalescent, and remained free from their disease for years, chiefly through the stimulating influence of the warm air on the cutaneous capillaries, and its acting with almost styptical powers on the pulmonary mucous surface.

In illustration of this point of treatment, I may adduce a case which fell under my notice some twenty years ago. Having the privilege of visiting and witnessing the medical practice of the —— Hospital, I was in flattering terms requested by one of the physicians, in the presence of some of his pupils, to give him my opinion of a patient who was suffering under catarrhal asthma, with pituitous discharge to a great extent. After having made myself acquainted with all the phenomena of the case, and finding that the lungs were inundated with serum and mucus, to a degree threatening suffocation, and that he was, in addition to the weakness produced by this, likewise debilitated by purgatives causing evacuations several times in the day, I hastened to pass my judgment as required to do, with as much readiness as I had testified in proceeding to examine the case. I very frankly pointed out the probable aggravation of the complaint by the undue administration of cathartics, and the want of counter-irritation to the chest. No sooner was my opinion declared, than the compliments he had previously paid to my acquaintance with pulmonary disease, even to the underrating before the pupils his own knowledge in comparison with mine, became entirely changed. His praise or the contrary was equally unimportant to me. I was aware that he was indebted for his situation, not so much to his talent as to his happy stars. Relationship put the "newest gloss" on his qualifications. In fact, the —— Hospital stands *per se* in the hereditary virtues of its medical officers; and if the spirit of clanship be ever extinguished among our northern brethren, it may be certain of a fostering asylum here.

To return to the case. The same plan of treatment was followed, and the patient finally became dropsical. He had heard my suggestions to try an alteration of medicines; and finding subsequently from a fellow-patient that I was physician to an infirmary for diseases of the chest, he of his own accord withdrew himself from the hospital, and applied to me. When I saw him at this period, his countenance was bloated, anxious, sub-livid; the lips, nose, eminences of the cheeks, and lobes of the ears were perfectly blue; his breathing high and painfully laborious; he could with difficulty support himself on his legs, which were quite dropsical. The cough and expectoration were almost incessant. He looked as if he had been long a stranger to sleep; and I found, indeed, that the dread of suffocation prevented his giving way to "tired nature's sweet restorer;" and that when, exhausted by sufferings and watching, he snatched a few minutes' repose, he would suddenly be awakened by the most fearful dreams. There being no vacancy at the moment, I was obliged to keep him for some time as an out-patient. I ordered the immediate application of blisters to the chest, but with a caution that they were to be removed from place to place previously to vesication. He was supplied with cretaceous medicine, having nitre and squill as adjuncts, with the intent of checking the undue relaxation of the bowels, and acting on the kidneys. I advised him to remain at home, with as much attention to warmth and comfort as he could command; he having suffered from cold in the extensive ward of the hospital in which he had been placed; and where the impossibility of resting in a horizontal posture, from the severity of his orthopnœa, kept the upper part of his body too frequently exposed. So critical did his situation appear to me, I felt it right to warn the person who accompanied him that, unless the remedies ordered produced relief, his early dissolution might be expected.

On next visiting day at the Infirmary, I was glad to be informed by his friend that he was somewhat better; and I directed the same treatment to be continued. In about a week after this I had a vacancy for him, and received him into the Infirmary. Here his amendment, within a very few days, was equally decided and remarkable. The bowels had returned to their natural state; the expectoration was daily reduced in quantity, with a wonderful alleviation of his other pectoral complaints; and, from the steady and efficient activity of the kidneys, the œdematous state of the body had undergone great diminution. With these favourable changes, his appetite also had, in a great measure, returned; and of course he became generally invigorated. So happy were the effects of the due regulation of the temperature, in conjunction with diuretics and rubefacients to the chest, that in two months he left the Infirmary in a most satisfactory state, without either cough, or any vestige of an asthmatic condition of the lungs. After giving him the directions proper to be followed, in order to prevent all danger of relapse, and above all enjoining him to be on his guard against the ingression of cold, I dismissed him with a recommendation to show himself to his former physician at the —— Hospital. I could do no less in return for the urbanity with which that person had treated me. Towards the close of the following winter, this patient called upon me to express his thankfulness, and to assure me that he had not enjoyed such a state of health for many winters, having been, for the ten preceding years, more or less a sufferer from asthmatic breathing.

It forms an interesting fact in the treatment of this disease that although, up to a certain period, the patient improved rapidly whilst under the genial influence of a duly regulated temperature, yet, if suffered to remain in it beyond a limited time, a sensible difference in health usually occurred. The reason is obvious. When first removed into what may be termed a warmer climate, the entire system was stimulated by the increased temperature of the air; and the surface of the body was excited to a quick and lively glow, constantly maintained. This condition was, for a time, as I have above stated, attended with the happiest effects; and I almost invariably found that two months was the maximum to which the residence of this class of patients in the Infirmary could be advantageously extended. If kept there for any period beyond this term, the result was, in some instances, unfavourable, owing to the want of exercise, and of the reaction which had taken place on his admission; for after he had reached the crisis of invigoration, he generally retrograded. Again, if the patient be dismissed after a protracted stay, he had become so acclimated to a warm temperature, that he was alive to every impression from cold; but if removed whilst the system, and more particularly the cuticular surface, were in a state of healthy activity, he became thoroughly fortified against the influence of a colder air, unless there was great imprudence on his part.

Having digressed at such length in noticing the influence of temperature, it is necessary to state, before I make my concluding remarks on the medical treatment, that the temperature usually recommended by me, both day and night, varied from sixty-five to seventy degrees of Fahrenheit.

Of the catarrhal affections, complicated with asthma, the pituitous is the most dangerous, especially to the elderly, and requires the utmost attention on the part of the patient. But should a relapse be, by due care, prevented, after a cure has been effected in the manner described, I generally find that he will get over the following winter without a return of the complaint; and in not a few instances continue free from it for years. When the result is not so favorable, great mitigation, however, will often occur from the patient's having the pituitous catarrh changed into a milder form, as that of mucous catarrh.

I have said that the pituitous form is the most dangerous, nor does the opinion want the support of many reasons. The patient's strength is exhausted by the abundant watery discharge from the chest; and there is always great danger of the supervention of œdema of the lungs, from the secretion's not being confined to the mucous surface of the lungs, but going on likewise in the cellular membrane. The asthmatic paroxysms are much milder in the pituitous, than in the other varieties of catarrh; and the probable cause may be that the constant secretion obtunds the nerves, and that thus the convulsive actions of the muscles concerned in respiration are less excited by irritation of the respiratory surface.

Since bleeding is at times resorted to in this disease, and since depletory measures are, in no form of catarrh complicated with asthma, likely to prove so dangerous, I think it necessary to mention that I have known very untoward results ensue from the practice. Indeed, after the serious weakness which I have mentioned as following the too copious use of purgatives, in the case of the patient of the —— hospital, detailed a few pages back, I need hardly dwell at any length on the probable effects of bleeding. Two cases fell under my knowledge many years ago, which made a deep impression on me. The one was in the person of a stout, able-bodied man, of about fifty years of age, affected with a pituitous catarrh, which had suddenly assumed an acute character. He was judged to be in a favorable state for bleeding, and blood to the extent of eight or ten ounces was taken from his arm; but before the assistant could bind it up he was dead. A thin, frothy fluid bubbled up to his lips, and continued for an hour, or more, after his decease; and on pressing the abdomen it came out in unusual quantity. The other case was that of an individual who had been subject to asthmatic attacks, and whose complaint, from the enfeebled condition that thus ensued, had degenerated into pituitous catarrh. Under the erroneous view of giving relief to the anxious respiration, and general pulmonary distress, he was induced, contrary to my advice, to submit to be cupped on the chest; but scarcely had the glasses been removed when he expired. In this case, the frothy fluid discharged after death was tinged with a brownish hue.

I may here notice a curious fact connected with this species of catarrh. The patient is much less liable to perspire than in the other varieties; and I attribute this want of action in the cutaneous capillaries, to the great secretion which takes place from the mucous surface of the lungs. It has been long noticed that, in the animal economy, the increase of one secretion causes the diminution of another; and thus it would seem that this pulmonary diabetes, if I may so term it, occasions the dryness of the skin, and coldness of the surface usually observable in this disease.

The best medicines are those which act as derivants, and especially those which determine to the surface of the body. Thus the compound ipecacuan powder, in small quantities, alone, or with some mild mercurial preparation, or else with some antimonial, may be steadily administered, with the view of producing a moderate perspiration, and thus counteracting the unnatural and debilitating bronchial secretion.

I have already had occasion to speak favorably of the effects of mercury, when properly indicated. When given in this form of disease, it proves a general stimulant: and it imparts energy to the absorbent system, whilst, at the same time, it establishes an equilibrium among all the important secretions of the body. A grain of calomel, or two or three grains of blue bill, administered with assafœtida, compound squill pill, or the compound galbanum pill, or myrrh, will be found, taken night and morning, for a short period, to agree well. I sometimes order squill, in combination with nitre: and I have observed that the substances, known under the name of expectorants, from their supposed power of acting on the respiratory surfaces, and on their secretions, instead of promoting diminish the secretion. They appear, in fact, in this disease, to excite the bronchial mucous tissue to a new action.

Warmth being so essential in this complaint, it may be recommended to the patient to keep the bed when his disorder is very troublesome; and especially when the weather is severe and frosty. The occasional use of the pediluvium is advisable; and, on the approach of the winter season, attention to the clothing is more requisite in this, than in any other complication of asthma. Care in this particular will never be thrown away; and during rigorous weather the patient should, if possible, keep entirely within doors. A warm climate is especially indicated in the chronic form of this affection; and a change, with this view, cannot be too strongly advocated.

Tonics and astringents would appear likely to be of eminent service; but although their use for a day or two may not be unproductive of good, they occasion what the patients feelingly term a tightening of the chest; and are, therefore, to be sparingly employed.

Having thus detailed the medical treatment proper to be observed in the pituitous catarrh, which is the most debilitating of these asthmatic complications, I now proceed to consider that which should be pursued in the chronic mucous catarrh, a variety which admits of much more vigorous measures. Slight fever is a very common accompaniment of this form of the disease, where the patient's constitution has not had time to be habituated to the complaint, or when any renewal of the attack happens to be severe. In some of these cases, too, small portions of the lower lobes of one, or both lungs will be found to be the seat of peripneumony, which is not easily detected, unless by the highly experienced auscultator. Abstraction of blood is, of course, indicated in the above instances; as likewise when the oppression of the chest is considerable, the cough violent, with pain more or less unremitting. For the most part local depletion by leeches, or cupping, will be sufficient; but when there exists local congestion, or general plethora, or inflammation to any extent, more active depletory measures may be resorted to. Blood may be taken from the arm, to the extent of ten or twelve ounces. When active treatment is rendered inexpedient, or impossible, either from the patient's time of life, weakness, or the long protraction of the disease, recourse may be had to blisters. The most efficacious mode of applying these, and other epispastics, I have already fully detailed.

It is desirable, in this disease, to alternate blisters with leeches. Indeed, medical men do not appear sufficiently sensible of the advantages to be derived from these local applications judiciously alternated. When care is taken that the quantity of blood abstracted by the one, and the discharge occasioned by the other, be not too great, the benefits are incalculable. This practice, conjoined with common caution in avoiding cold, will be found to preclude the necessity for much internal medicine. The most serviceable remedies in such cases are the saline febrifuges, such as nitre, the liquor ammoniæ acetatis, &c., with a small quantity of tartar emetic; and, in fine, all that class which will either determine to the kidneys, or excite the skin to a healthy moisture. On the subsidence of every prominent symptom of fever, sedatives, as extract of poppies, henbane, &c., may be administered: and as the alkalies exercise a great influence in diminishing the morbid sensibility of the mucous surfaces in various parts of the body, in a manner not easily accounted for, I usually prescribe Castile soap, in combination with the above sedatives, and a grain of ipecacuan, or of squill, in each dose. Laennec states that narcotics, and in particular the recently prepared powder of belladonna or stramonium, in doses of half a grain to a grain, afford most relief. Their administration is frequently followed by the speedy, but temporary cessation of the dyspnœa. This he attributes to the diminution of a necessity for respiration; but it is rather to be ascribed to their anti-spasmodic power. The lessening of the spasm admits a readier passage for the ingress of the air; and consequently if the inspirations are not so frequent, they are yet of a fulness which more than compensates the apparent diminution. During the spasmodic state, too, the substances, which ought to pass off freely in the expiration, as nitrogen, carbonic acid, and aqueous vapour, are injuriously retained; and serve, in many instances, by their undue retention, to maintain the dyspnœa. Such a condition likewise must exert no small influence on the sanguification, and on the animal temperature.

From the time of Cælius Aurelianus, the inhalation of medicated vapours has been recommended in diseases of the lungs. I have offered some remarks on their use in the essential, or nervous asthma. It is possible that when steadily followed up for a considerable period, the passage of various medicinal substances along the mucous surface of the bronchial membrane may be productive of some beneficial change in this form; but I attach no importance to their exhibition, when the lungs have been long emphysematous from the continuance of the disease. The fumes of different narcotic substances, as hemlock, hyoscyamus, extract of lettuce, or extract of poppies, arising from pouring boiling water over them, either alone, or in conjunction with camphor, or aromatic vinegar, may be used. Balsam of Tolu, dissolved in sulphuric æther, or the vapour of the sulphuret of iodine, may also be recommended for the purpose. When the fumes of chlorine, or of boiling tar, are used, the preferable method is, to suffer the vapour to be diffused through the air of the apartment. It should, however, be observed as a general rule, that if the cough is aggravated, and the circulation quickened, their use should be at once discontinued; and that the vapour of the more stimulating substances should at first be exhibited in a very diluted form.

I entertain little doubt that in many cases, in which benefit has been derived from inhaling the above substances, chronic mucous catarrh may have supervened on consumption; and in such instances I have ever known the practice attended with the most favorable results. The "modus operandi," in these cases, has been already submitted to the medical profession in my Treatise on Consumption; and for the pathological reasoning on which it is founded, I must refer the reader to that work.

The good accruing from the inhalation of various forms of vapours in catarrh may, at times, arise from their action on the mucous surface, and it is frequently attributable to the improvement produced, in some measure, on the general health by the influence exercised on the sanguification by the process of inhaling.

Numerous patients, labouring under this disease, have, in general, experienced the most marked benefits when placed under the influence of a well-regulated temperature. I have adverted to the good effects derived from warmth in chronic pituitous catarrh; and they are no less observable in the present variety. The secretion is lessened, and a change is effected from the heavy, yellow sputa excreted in this affection, to a healthy mucosity; and where the asthmatic complication has been well-marked, it has been often permanently removed by the relief of the catarrhal state.

Different balsams have been lauded in this disease, and especially that vulgarly called the balsam of copaiba. This has met with several advocates, and the late Dr. Armstrong in particular has been loud in its praise. He wrote, however, I apprehend, from views chiefly gleaned in private practice; and such writers must ever labour under the defects inseparable from insufficient data. Copaiba is usually very revolting to the stomach, and is far from being certain either to soothe the cough, or alter the expectoration.

Counter-irritation, by means of friction, and the application of tartar-emetic ointment, is at times employed; and the pustular eruptions thus produced are occasionally kept up for no inconsiderable period. This practice is by no means a favourite one with me in any visceral disease; in fact I have often found the constitution sympathize injuriously with the local excitement thus called forth.

I now come to consider the treatment of the dry catarrh, which is almost invariably chronic. This disease is not always primary, but may supervene either to convulsive asthma, or to the other varieties of catarrh, and when extensive is eventually accompanied by emphysema of the lungs. As there is little or no defluxion to attenuate the body, and the constitution is thus not much disturbed by the local affection, in comparison with what occurs in other catarrhal disorders, the patients are usually healthy in appearance, and subject to plethora. Since those individuals, who labour under dry catarrh, have, in general, voluminous lungs, from co-existent emphysema, the first point to be attended to in the curative process is the avoidance of all unnecessary exertion. Ascent of any kind, and even the mere walking upstairs, are certain to induce shortness of breath, by the upward movement thus given to the diaphragm; which, in its turn, presses on the lungs already too large for the purposes of free respiration, and impedes their action. The same consequence will ensue from gastric repletion; as also from flatulence of the stomach and intestines. It follows, then, that the patient should be doubly attentive to the due regulation of his bowels, and carefully avoid their being over-loaded by either indulgence on the one hand, or neglect on the other. In some individuals suffering under this complaint, it will at times happen that the chest does not exhibit externally that enlargement, which I have stated to be a consequence of the increased volume of the lungs; but in such cases it will be found, that what is wanting in width is often compensated by the extension of the lungs from above downwards, thus encroaching considerably on the abdominal cavity.

Another caution very necessary to be given the patient in this disease, is to guard against the ill effects likely to arise, without due care on his part, from changes of weather. From being accustomed, even during summer, to some shortness of breath, a carelessness, as to exposure to cold, is induced by the idea that he can hardly be more incommoded than he is, and he thus becomes the most heedless of all catarrhal sufferers.

The derangement of the circulation, which is connected with frequent congestion of the lungs, and which I have already had occasion to explain, is, at times, productive of some affection, the co-existence of which with dry catarrh has occasioned the several names of hepatic, gastro-enteric, hysteric, &c., to be given to the cough, according to its presumed connection with the particular organ thus implied.

If the patient happen to have the disease unaccompanied by cough or expectoration, or, in other words, if he be affected by latent or dry catarrh, it is in his power, by care and prudence, entirely to emancipate himself from the dyspnœic symptoms. Supposing that he could remain without the above conditions being made manifest, the simply enlarged air cells would, in time, return to their natural size; but to find a patient sufficiently cautious for this to take place would indeed be a miracle. The asthmatic patient so circumstanced is always prone to consider himself convalescent when he contrasts his condition with that of the more violent sufferer; and instead of measuring his state by that of perfect health, he inconsiderately makes disease a standard by which to form his estimate.

It is, indeed, no uncommon occurrence to find persons habitually subject to dry catarrh suffer attacks of this form of the affection, in which case the shortness of breath is of course much aggravated. The mucous membrane of the bronchi will become tumefied, some fever supervene, and a fit of asthma be at length induced. When these attacks have been frequent, fever is seldom recognised, since the constitution no longer sympathizes with the affection of the chest; except, indeed, when the attack happens to be of unusual severity.

Laennec denies that any advantage is derivable from bleeding in this form, and some periodical writers in our own country, who servilely transcribe his views on the subject, echo his opinion. But the greatest genius is not infallible; and experience has sufficiently proved to me that when there is an accession of fever, and the patient's countenance indicates distress, and there exists congestion with lividity of the lips, and other signs of circulatory disturbance, the lancet, judiciously employed, is productive of decided good.

I may here observe that I am no friend to the unnecessary abstraction of blood, and would by no means encourage a wanton expenditure of the *pabulum vitæ.* Still, in cases such as I have just alluded to, and when the age of the patient does not contra-indicate bleeding, it would be unwise to reject a positive good for an hypothetical ill. At all events, local depletion may be unhesitatingly recommended in this, as well as in the other species of catarrh. I prefer leeches to cupping; yet the latter may be at times safely and advantageously employed. Sometimes the circulation will become so languid as to induce a morbid susceptibility, which renders the patient liable to be affected by slight changes of the atmosphere, or other trivial occasional causes. From this, and other considerations, as well as from the fact that those who are habitual sufferers from this disease, are seldom disposed to inflammation, it will always be advisable for the physician to act on the expectant principle, and to wait a reasonable time to see if any change will occur to obviate the necessity for depletory measures.

Having been already very full and explicit upon the treatment of the other varieties of catarrh, and having given the reasons for the exhibition of the different medicines therein recommended, in accordance with the various states and stages of disease, it would be repeating what has been previously said to enter minutely into the practice to be followed in this form. Generally speaking, what is applicable to the accidents of the one, holds good with respect to those of the other. The chief point to be attended to is the complication; and ample directions have been given whether this take the chronic pituitous or that of the chronic mucous catarrh. Attention should be especially given to diminish general excitability, and to regulate the circulation. When febrile symptoms occur they should be carefully watched, and recourse may be had to the cooling saline medicines, antimonials, &c.; and, when it is an object to promote expectoration, the different preparations of squill, combined with ipecacuan according to the various formulæ already presented, with demulcent drinks, may be resorted to.

CASE OF CHRONIC PITUITOUS CATARRH, COMPLICATED WITH ASTHMA.

E. E., aged 50, applied to me some years ago. Her appearance was delicate, or rather emaciated, and betrayed all the signs indicative of mental trouble and bodily fatigue. On tracing the history of her case, it appeared that she had been formerly of sanguine habit, and likewise possessed of a good constitution; but that the toil attendant on rearing and providing for a family, (she belonging to the working class,) and the deprivations to which she had been exposed, had gradually undermined her health. This deterioration proceeded slowly at first; but at length her constitution underwent a sudden and great change at what is always a very critical period in the life of a female. The first distressing symptom was cough, which, after a time, was accompanied by expectoration of a yellow colour, occasionally streaked with blood. Towards evening, flushings and general hectic disturbance would come on; and these gave rise to a fear of consumption, to which disease a sister of hers had some time before succumbed. The room which she occupied having a chimney which smoked when the wind was in a particular direction, this inconvenience added to the severity of the cough; and, on one occasion, aggravated it to such a degree of violence that she momentarily expected to rupture a blood-vessel. From this period she first experienced difficulty of breathing; and soon afterwards her expectoration began to change its colour, to assume a greater degree of mucosity, and to diminish in quantity.

A change for the better took place not long after; but this was only temporary. The difficulty of breathing came on in a still more painful degree; and one evening, after a day of more than usual fatigue and privation, she was suddenly seized with an attack of spasmodic asthma. The fit subsided towards morning, but recurred on the two following evenings about the same hour that the first attack had manifested itself, although with mitigated symptoms. From this time the spasmodic paroxysms returned at uncertain intervals. She continued in this state for many months, during which she had to struggle with the worst ills of poverty. Insufficiency of food, exposure to cold both in and out of doors, and the other privations which accompany scanty means, seriously affected her constitutional health, and she began to expectorate in considerable quantity. The mucus thus excreted was thin, nearly colourless, underneath like water, but thicker, and with beads or a head on its surface. On some occasions, after violent coughing, this would present a somewhat reddish tinge. The paroxysms of asthma now came on less frequently, and at length seemed to have disappeared, although she laboured under almost habitual dyspnœa. She complained of having suffered much at this time from cold of the extremities, and other symptoms evidently connected with disordered circulation.

It was in the third winter of her being in this state that she first applied to me, and at this period she was evidently labouring under confirmed pituitous catarrh. Her breathing was anxious and frequent; she complained much of pain in the head; and, when a violent access of coughing came on, her lips would assume a sub-livid appearance, and the intensity of the cough would not only cause turgescence of the veins of the forehead, but even gave rise to so great a distension of those of the neck as to occasion cerebral congestion; the respiration also became stertorous, and the patient fell momentarily into a comatose state. Examination by the ear and by the stethoscope yielded the moist sibilant *râle*, as well as a mucous *râle* of a watery character. From the quality of the sound given out in expiration over the region of the summits and other parts of the lungs, and which might be likened to air squeezed out of some porous compressible body, it was clear that emphysema had begun to manifest itself.

Fortunately for the poor sufferer, a favourable change in her circumstances occurred soon after I first saw her, through the death, if I recollect aright, of some relative. The happy effects arising from her bettered condition were not long in making themselves perceptible; above all, the warmth, both of clothing and in her residence, which she was now enabled to enjoy, produced the most salutary effects. She rapidly gained flesh, her cough and its attendant expectoration diminished in a surprising degree; and, although the dyspnœa continued, it was much moderated.

The asthma, it must be noted, has never returned subsequently to this happy alteration in her means; and its non-recurrence may, I would suggest, be attributed not less to the ease of mind thus imparted, than to the personal comforts she has been enabled to indulge in.

Having already given a minute account of the treatment observed in a similar case, it is unnecessary to describe the particular practice followed in this, as it would be merely a repetition. I may mention, however, that blisters were occasionally used with advantage, according to the plan I have laid down. She passed from under my care with very little of her disorder remaining, but with the lungs, as usually occurs, still slightly emphysematous. A few years afterwards I had an opportunity of making inquiry as to the state of her health, and was gratified to hear that she remained perfectly free from her former complaint.

CASE OF CHRONIC MUCOUS CATARRH, CO-EXISTENT WITH ASTHMA.

James S., Esq., aged 25, applied to me on the 19th of May, 1824. He stated that eight years previously he had been first attacked with difficulty of breathing, which continued to return at irregular intervals. Taking cold, however slight, was certain to induce a recurrence of the oppression. This dyspnœa usually came on in the evening, although occasionally it would appear in the morning. Its common duration was an hour, or a little longer;

and, on the day following, his respiration would be perfectly free and unembarrassed.

He continued subject to these attacks to within about eleven months preceding his application to me. At this time they suddenly assumed a different character. He was seized between five and six o'clock one morning, almost instantaneously, with a sense of violent constriction in the thorax, and serious obstruction to respiration, which compelled him at once to assume the erect position. At times the pain would be so intense, and the difficulty of breathing so great, that he would sit down with his legs lifted up and his body pressed down towards the thighs, so as to describe a curve, in order, as it were, to neutralize the convulsive efforts of the respiratory muscles.

Since the last-mentioned date, these paroxysms returned at intervals of eight or nine days, but never exceeding the latter. They were attended with severe head-ache, general prostration of strength, and, when very intense, with some fever, each exacerbation of which was accompanied by chills. These fits usually commenced about the same hour in the morning, and lasted an hour or an hour and a half, terminating after repeated coughing in the expectoration of clots of a viscid mucus with dark-coloured striæ, and at times, yet rarely, tinged with blood. The cough was most violent on first awaking in the morning, on motion, or after taking food, and in such cases was only relieved by the rejection of a white ropy matter from the stomach. The day preceding the paroxysm, its approach was ushered in by unusual cheerfulness, and sense of better health than ordinary; these symptoms were accompanied by a sensation of fulness in the epigastrium.

The phenomena of respiration, discoverable by auscultative examination and as noted at the time, were as follow:—

"At times, the murmur of respiration is temporarily perceived in some portion of the lungs, particularly towards their root; and it varies its sound, being more or less audible through the diminution or increase of sputa in the air-passages. In the respiration the expiratory murmur is loud and prolonged, as in cases of vesicular emphysema: in fact, this last-mentioned condition is the never-failing consequence of any protracted catarrhal affection. As the act of inspiration commences, the ear can detect the sonorous *râle*, resembling the cooing of a dove; as the respiration proceeds, this sound is blended with mucous *râle:* and, as it draws towards its completion, this in its turn is merged in the sibilant. Bronchophonism is detected in more than one point of the lower lobes, indicative of bronchial dilatation; and, from the gurgling sound emitted from such parts, I entertain little doubt that the dilatation is considerable."

Although I have no reason to believe that the patient was ever in danger of becoming phthisical after I first saw him, yet, from the great emaciation he had exhibited, and from the expectoration of singularly fœtid matter of a greenish hue, it was at one time supposed that he was actually labouring under consumption. In the correctness of this supposition I have every reason to concur, and that for stronger motives than the apparent similarity of the symptoms displayed by this disease and pulmonary phthisis; auscultation, along with due attention to the early history of the case, will often enable the practitioner to detect the decidedly phthisical character of the original or primary disease.

To enter upon the treatment of this case, after the directions I have already given for the practice to be followed in chronic mucous catarrh, is unnecessary. Besides, in the present instance, I must candidly confess that the patient was more indebted to circumstances than to myself. An opportunity offered for his taking a summer voyage up the Mediterranean. I advised him at once to accept it; and nature did her work better than art: he returned at the end of five months to all appearances cured.

Although a strenuous opponent, both on scientific principles and from sad experience, to the removal of consumptive patients to warmer climes, in which they for the most part find a grave; yet in this, as well as in the pituitous variety of catarrh, such a change may be productive of benefit.

CASE OF DRY CATARRH, COMPLICATED WITH ASTHMA.

I have selected the following out of a number of cases of long standing I have registered by me, chiefly from the plain and straightforward way in which the patient has himself detailed it.

"* * * I was first seized with an affection of the breath after running very quickly for about half a mile, in order to be in time to send a parcel by the Liverpool coach. Being much heated, I incautiously drank nearly a pint of porter. I experienced no inconvenience at the time; but the next day I had a pain in the back, like lumbago. The day following, cough came on. This increased daily, until about the fifth or sixth day; when the wheezing and difficulty of breathing were so great at night, that I could scarcely lie down. I sent for a medical gentleman, who blooded me in the arm, and gave me medicine to be taken every four hours. I continued in the same state for a week, when a blister was ordered, and medicine as before, but without any benefit. The next week I had another blister put on, and kept it on for several days, the discharge being very great; and at the end of this, the fourth week, I left off medicine altogether, feeling that I began to mend rapidly.

"This first attack was in the month of September. I continued well during the following winter and summer; but, about the same period at which I had experienced my first attack, I felt the wheezing come on to such a degree, that I was obliged to call in the same gentleman. He treated me as on the former occasion; and, after about three weeks or a month, I got better as before. The third year I was affected just at the same period, and in a similar manner. I objected to bleeding, which was at first proposed, since I had derived very little benefit from it the preceding year, and it brought on such weakness. I was blistered, and had leeches applied to me, besides a bottle of medicine daily for three weeks. I did not mend much: the wheezing and difficulty of breathing continued; and I made up my mind to leave off the medicine, although I remained so ill. About a fortnight after my wheezing left me all at once. It is now nearly ten winters since my complaint commenced."

Thus far the patient; but, on questioning him closely, I found that in addition to the symptoms noted above, he had been occasionally subject, sometimes on the subsidence of the attack, at others in the midst of a long intermission, to scanty expectoration. This would likewise come on from what he termed catching cold in the head. About the sixth year from the first manifestation of the asthmatic complaint, he had been induced, at the solicitation of a brother in the East Indies, to go out and join him. During two years that he continued there, he had lost not only his asthmatic attacks, but every vestige of unnatural secretion from the chest. He remained thus exempt for a year after his return; and it was not until an advanced period in the fourth year from the apparent cessation of the disease that his old complaint returned. Eating heartily of a fish supper, according to the patient's supposition, brought it on. In the middle of the night he was seized with the severest paroxysm he had ever experienced; and which continued, with hardly any abatement, for forty-eight hours. The medical adviser he called in deemed it necessary to abstract blood; and this was attended with salutary effects. After several attacks, which were unaccompanied by expectoration, he at length, on one occasion, expectorated a wine-glass full of mucus as black as ink: this was followed by a sense of heat in the centre of the chest. He kept this fluid by him for full three weeks, when it grew a little lighter in colour.

It would appear that this unusual secretion formed a sort of crisis in his complaint, since after it he lost his paroxysmal dyspnœa; but he continued subject to difficulty of breathing on ascending any eminence, or using rapid motion immediately on leaving his house. After a gentle walk for some time, however, he could accelerate his pace, and use considerable pedestrian exertion without experiencing any labour in his respiration. While thus, comparatively speaking, free from his complaint, I saw him at intervals during a period of eighteen months, or thereabouts, and used, on such occasions, to examine the state of his chest.

On examining the physical signs, there was no absence of respiratory murmur indicated in any portion of the lungs, although it was far from distinct, and was blended with a rough sound; nor did percussion previously applied elicit anything unnatural. He had likewise a slight sonorous wheezing in the expiration. When the wind changed to the east or north-east quarter, his breathing became immediately embarrassed; and even when in bed he was sensible of the alteration. In like manner, when travelling, he could at once tell whether any great difference had taken place in the level of the road he was on, by the peculiar impression conveyed to his lungs when the elevation was increased.

Towards the spring, the application of leeches and exhibition of medicine having removed the congested state of the bronchial mucous surface, and finding his breathing to all appearance perfectly unembarrassed, he was anxious to be allowed to repair to the sea-side for the pleasure of bathing, and likewise from the report of an asthmatic friend, who had derived great benefit from the cold bath. On renewing my examination, I ascertained that the bronchial obstruction had disappeared; accordingly, as his digestive functions were carried on in a healthy manner, and there was an equable warmth pervading the body throughout, I consented, as the summer set in warm, to permit a conditional trial of immersion in the open sea. He was positively enjoined to discontinue bathing, should he experience the slightest catarrhal uneasiness; and I particularly impressed upon his mind the necessity of taking but one plunge, and not indulging by prolonging his bath. He was recommended to try it at first twice, but on no account to exceed three times a week. He remained by the sea-side about two months, and returned much benefited by the excursion. I saw him two or three times subsequently to this, and ascertained that he went through the succeeding winter without any recurrence of his complaint.

It rarely happens, unless through the medium of mechanical agency, that, after the asthmatic diathesis has continued so long, perfect recovery takes place. I have already alluded to the seemingly critical nature of the secretion which altered the character, and was succeeded by an abatement of the severity of his complaint. The occurrence is singularly unusual; and, in the whole course of my practice, I have met with but one case presenting a similar phenomenon.

This discharge, in all probability, had its origin from some enlargement or other morbid state of the bronchial glands, at the roots of the lungs.

The above three cases have been subjoined to my remarks on the catarrhal varieties of asthma, in conformity with the plan of the work, which the reader will find previously noticed.

I shall take the liberty of quoting a case detailed in M. Lebeau's preface to his translation of my work on pulmonary consumption. It was given by that gentleman for the purpose of proving the great power which pulmonary expansion, by whatever means induced, exercises on the cure of phthisis. The high character and rank of M. Lebeau, holding as he does the rank of Physician to the King of the Belgians, and at the head of a great military hospital, must attach great weight to his authority. The case was adduced as a striking instance of the great influence which asthma possesses in both preventing and arresting consumption. The case was one out of several others which fell under his observation tending to prove the same important fact.

M ———, aged 48, a captain of an infantry regiment, presented himself April 26, 1836, at the military hospital at Brussels, with a view to obtain a certificate to exempt him from active service, in consequence of habitual dyspnoea. He complained of no other ailment, and was of full habit; his chest of remarkable amplitude, respiration wheezing, the sibilant râle was heard throughout, the heart's action regular and moderate, the pulse calm and natural, and the face exhibiting no signs of venous congestion. He gave the following account of his case, in the presence of Dr. Coombe, of Edinburgh, who happened to be there at the time, Drs. Limauge and Biefve, of Brussels, and several pupils:—"In 1816, after severe fatigue, I was attacked with cough and copious expectoration, wasted away rapidly, and was subject to shiverings in the daytime, and perspirations at night, with wandering pains below the collar bones. My medical attendants repeatedly assured me I was consumptive, and could not long survive. While matters were in this state, I was seized with a difficulty of breathing, to such a degree, as to oblige me to get out of bed at night and repair to the window to breathe fresh air. From this period my strength began to return, the perspirations ceased, and I soon became as plethoric as you now see me. My chest, which was flat and contracted, enlarged in an extraordinary manner, and I was completely cured, save the difficulty of breathing, for which I could obtain no remedy."

M. Lebeau adds that Dr. Canstatt, a young physician of great merit, had related to him a similar and strikingly illustrative case which had occurred in his own family.

ASTHMA,

COMPLICATED WITH ORGANIC LESIONS OF THE HEART AND LARGE VESSELS.

AMONG the numerous advantages derived from the discovery of auscultation, as a means of distinguishing the causes of disease, may be classed the power it has given of ascertaining the dependance of asthma on any lesion of the great organ of circulation. The existence of such complications was previously of difficult and doubtful recognition; yet few are more frequent, none more distressing.

The improved methods of diagnosis have indeed removed that obscurity under which disease of the heart, at no very distant period, was veiled from the knowledge of the practitioner. By conjoining the physical signs yielded by auscultation and percussion with the general signs now so much better known, and more accurately accounted for through the aid of the former, the lesions of this organ may be detected even in their earliest stage; and thus, when they cannot be removed, they may at least be so effectually checked and counteracted that we are oftentimes enabled to prevent all fatal consequences.

There can no longer be any excuse for the mistakes, which were once so frequent, of pronouncing the liver or the stomach to be the seat of derangement, when, in point of fact, the chest alone is affected; nor, on the contrary, can diseases of the heart be now mistaken for affections purely dropsical or asthmatic.

The order of causation in cardiac disease is by no means regular. Generally speaking, the asthma precedes the organic affection; but, although commonly the primitive disorder, it is at times consecutive. The intimate connection between the lungs and the heart, and the close anatomical and physiological relation which the nerves of both organs bear to each other, exert a powerful reciprocating influence. Thus, disease of any portion of the nerves belonging to the respiratory apparatus, will readily affect those appertaining to the heart, and functional derangement of the latter will, of course, as speedily extend to the former.

Hence asthma, thus complicated, may simulate any of the varieties of the disease, whether dry or humid; or, more strictly speaking, asthma of every species may degenerate into pseudo-asthma by becoming complicated with organic lesions, whether of the heart or of the large vessels.

It must be obvious, even to the unprofessional reader, that scarcely any organ in the human frame is so liable to disorder, both from physical and mental causes, as the heart. From the throb of childhood, to the last feeble pulsation which links time with eternity, what a countless series of impressions does this organ, at once passive and active, the seat of sympathy, no less than the fount of energy, undergo! To it may be applied the words of the poet:—

> "*Injuriæ,*
> *Suspiciones, inimicitiæ, induciæ,*
> *Bellum, pax rursum.—*"

for to the influence of these several conflicting feelings is the heart liable, times innumerable, in the course of one brief life.

The idiom of every language borrows its strongest expressions from the part which this wondrous agent, whether doing or suffering, acts in our microcosm. "I am glad of it, with all my heart," is a simple expression, but full of meaning, and admitting no increase—it is the superlative of content; whilst the homely phrase, "I am sick at heart," conveys the utmost idea of human distress.

If, then, mental causes accelerate, retard, heighten, even till they become perceptible by the ear, and finally arrest the beatings of this the main-spring of life, no less in its turn does it influence the functions of the other parts of the system. The stream which bounds through every artery, distributing its genial influence, and gently courses through every vein, is propelled by the inherent power of this life-dispensing machine; but, let the slightest injury be done, and the whole fabric feels the shock.

The symptoms exhibited by the patient who labours under asthma arising from disease of the heart are, generally speaking, those observed in the sufferer from the idiopathic form of the affection, but much exaggerated. They differ in degree, rather than in kind: the one is pain, the other agony. Mental emotion, violent exertion, or even the act of ascending a height, usually calls forth the first indications of the existence of the disease. A sudden difficulty of breathing, seeming to threaten suffocation, commonly attended with palpitations, and disappearing as suddenly, announces the presence of the cardiac lesion. These attacks are repeated; and, after recurring several times, fresh symptoms supervene, and are not long in bringing on the worst stage of the disease. The mind begins to be affected by the deranged functions of the body. A depression of spirits, and prostration of the moral energies, amounting at times to melancholy madness, attest the "corruption mining all within." Dreams of the most frightful character invade the domain of sleep: convulsive starts refuse any long continuance of rest. The countenance becomes a sure but fearful index of the racking nature of the disease. Its size is enlarged, and its colour, in general, a dark purple or violet hue. At times, its usual bloatedness is rendered more marked by a ghastly pallor; but, whether suffused or pale, the general decomposition of the features gives that peculiar expression, or "facies propria," which at once characterizes the disease. The horizontal posture is now impossible. Night and day will the sufferer remain, for weeks and months, sometimes snatching an uneasy slumber, with the body slightly recumbent, but usually leaning forward, the knees brought near to the chest, so that the abdomen rests upon the thighs. The alteration in the face increases. The lips swell, and turn black; the eyes are often hid by the œdematous swelling of the lids, and the features are hardly recognizable. When the paroxysm puts the patient on the rack, his looks become maniacal: each respiration convulses the frame. The eyes glare wildly, the nostrils expand, the anguish of the body is revealed by the horror of the face; and every convulsive gesture and muttered word betray the intolerable misery of the sufferer. The respite afforded either by exhausted nature sinking into occasional slumber, or the momentary cessation of the fit, serves but to arm its recurrence with redoubled terrors. Its approach is the signal for despair; reason wavers on her throne, and "Luke's iron crown and Damien's bed of steel" would be a blissful exchange, for they would accelerate the tardy pace of death. At length, worn out by reiterated attacks, every power gives way; volition fails, the mere machine continues for some brief space its instinctive movements, and—all is still.

Were it possible to produce a correct classification of the causes of diseases of the heart, I think it would be found that the largest class (in adults particularly) included those of a moral character. The next most prolific source of these direful maladies would probably be a congenital disproportion between the parts of the heart. The influence of the passions on the great organ of circulation has been already adverted to. Whatever either excites or depresses is equally injurious; and, as the fatal effects of both excess of joy and of grief, when suddenly called forth, have been so often witnessed as to be beyond the reach of doubt, so the occurrence of permanent lesions from the gradual influence of similar causes can hardly be disputed.

The hereditary nature of these diseases has been long known, and many singular instances of the fact have been recorded by Lancisi, Morgagni, Corvisart, Testa, &c. Bertin has successfully disproved the supposition so strongly expressed by Corvisart, of the influence of the syphilitic taint in valvular affections; and both Testa and Kreysig have laid a stress on the retrocession of cutaneous diseases as a cause of cardiac lesions, which my own experience has taught me is not exaggerated. External and accidental circumstances, as blows and falls, extraordinary muscular exertion in lifting heavy weights, or in personal struggles, and even too great or prolonged exertion of the voice, will frequently produce serious disturbance. The effects of sympathy, from derangement of other parts, are likewise very perceptible in this organ. All affections of the lungs, occasionally perhaps enlargement of the liver, with other obstructions of the abdominal viscera, or, in fact, any derangement of the stomach, are common and powerfully exciting causes of diseases of the heart. The connection between the stomach and heart, by the medium of the par vagum, and the direct action of abdominal obstructions by interfering with the circulation through the large vessels in their vicinity, readily explain the mode of action of these causes. Last on the list may be mentioned the action of gout, rheumatism, and various other diseases of an acute and chronic nature, as a no uncommon source of lesions of the heart.

It must, however, be stated that asthma is by no means a certain consequence of such organic changes; indeed, these are no less frequently the results than the causes of this disease. To produce the asthmatic diathesis, there is required a certain state of the nervous system, inducing a spasmodic contraction of some portion of the aërial passages, which can only be traced in its effects: it is impossible to recognize it antecedently, although no doubt can be entertained of its existence.

When the congestion of the lungs consequent on the affection of the heart is only temporary, the cough is slight, and, for the most part, unattended with expectoration. In such case, the fit subsides soon after nature, by determining to the surface, has relieved the engorgement of the heart and large vessels. But when the congestion is permanent, the cough is violent; and the viscid mucus, at first expectorated with difficulty, changes into a copious thin secretion, frothy, and sometimes streaked with blood. Yet the relief thus afforded to the dyspnœa is slowly consummated; and the paroxysms will at times last, with slight intermissions, for several days.

It is to be borne in mind, that in every disease of the heart obstruction is given to the course of the venous circulation; and that from this general œdema, its usual consequence, often arises. In the first place, whatever be the cardiac affection, the venæ cavæ will be congested; hence we can account for the occurrence of anasarca, by the undue retardation of blood in the veins preventing the free transmission of this fluid from the arterial extremities into their anastomosing veins. The lymphatic absorption is thus interfered with; and nature, exerting herself to establish a balance between the several branches of the circulatory system, throws off some portion of the accumulated blood, by means of the exhaling orifices of the arteries. The constituent discharged is the serum, and through this effort commences general dropsy.

Among a variety of causes which I might mention I shall particularize three, through whose influence the asthmatic complication may be induced by cardiac disease. The first of these is congestion of the mucous surface of the aërian passages, exciting their fibrous structure to undue contraction. This will inevitably ensue from the impediment thus created to the free return of the blood from the bronchial arteries into their receiving veins, as the superior cava, the vena azygos, &c. Hence will arise some catarrhal complaint; or, if the patient have the nervous idiosyncrasy predisposing to it, asthma.

A second cause may be stated as follows:—any circumstance calling forth increased energy of the right ventricle of the heart will produce pulmonary engorgement. The celerity and force with which the blood is propelled into the lungs will likewise communicate a degree of irritation to the air-cells, as well as by sympathy, to the mucous surface of the bronchial tubes. Again, should there exist any lesion on the left side of the heart, as, for example, auriculo-ventricular narrowing, or some diseased state of the semi-lunar valves, &c., the return of blood through the pulmonary veins will also be impeded, and congestion of the lungs occur, affecting the respiratory surfaces in a manner similar in its results to those of the foregoing pre-supposed condition. A lesion on this side will also tend to produce organic derangement of the other. The right ventricle, stimulated to strong efforts in order to overcome the resistance offered by the congested state of the left side of the heart to the return of the arterialized blood from the lungs, will, through its increased action, become in process of time hypertrophied; and arterial and venous congestion will at the same time concur to exasperate and call into undue activity the respiratory functions.

A third cause may be aneurysm of the arch of the aorta encroaching on the calibre of the trachea, impeding both the admission of air into the chest as well as its egress, and thus giving rise to an emphysematous state of the lungs, with all the symptoms of asthma. The irritation excited in the mucous surface of the trachea by the external pressure of such a tumour is often extended to the ramifications of the bronchi, and productive of catarrhal disease, and in some instances of genuine asthmatic respiration. Except in its very incipient stage, the practised auscultator will generally be able to detect any complication of this nature.

The above is a slight sketch of the mode in which cardiac disease, by interfering with the circulatory functions, at length produces the catarrhal or asthmatic complications. To enumerate all the various lesions to which the great organ of circulation is subject, and to enter upon a description of the peculiar agencies of each, would require a separate volume. It is incumbent in a general view of any subject to allot a due proportion to each of the parts into which it is divided; and sufficient, it is hoped, has been said to give an insight into the nature of the disease forming the present division of the subject.

The chief considerations in the treatment of Cardiac Asthma, are the diminution of the too active state of the circulation, if such exist, and the abatement of any inflammation, chronic or otherwise. Of course, I am now speaking of the early stage of disease of the heart, since any hope of arresting it is to be entertained at this period only. When the measures necessary to stay its progress have been neglected, and considerable dilatation, hypertrophy, or other serious organic change has long existed, the utmost that can be looked for is to afford temporary relief to the sufferer. It is too often impossible to detect the causes operating to effect the lesion, previously to its formation; and hence, it is only when established that we can in general begin to palliate the evil. Taken early, however, its progress can be arrested, and its consequences so much mitigated, as to ensure, so far as the lesion is concerned, the prolongation of existence for years. Ordinarily speaking, temperance in diet, with occasional abstraction of blood generally or locally, when judiciously modified according to the temperament and age of the patient, will render the disease, comparatively speaking, inert. The intermission is the period in this, as in every species of asthma, to which the practitioner should especially devote his attention; since it cannot be too often inculcated that his chief aim should be to avert the recurrence of the attack, and thus prevent the establishment of the asthmatic diathesis.

The principal object in disease of the heart being to diminish the irritation occasioned by over activity of the circulatory functions, general bleeding takes the lead in the treatment to be pursued. Yet the local abstraction of blood is, in many instances, to be preferred, even without the previous use of the former.

The treatment first laid down by Valsalva, or, more strictly speaking, first practised by him and since advocated by Laennec, is much too violent and indiscriminate. It will indisputably at times cure; but then it will much more frequently kill. Inordinate depletion and rigid abstinence form the groundwork of this unsparing method. We are told that even when "anasarca, œdema of the lungs, and a general cachectic state of the system are present, we are nevertheless unhesitatingly to pursue the plan of bleeding and starvation." When so great a man as Laennec could fall into so signal an error, well may it excite wonder to find writers quoting with blind reverence, as their authority for absurdities, names which, in comparison with his, are as a rushlight to the sun, and which indeed are unknown beyond the "narrow precincts of our isle."

Such a system rigorously pursued would occasion, supposing them not to exist already, the very evils it seeks to remedy. The lowering of the vital energies to such excess will not only accelerate the circulation by the demand it makes upon the system to supply the place of the abstracted blood, but will interfere with the due processes of nature in many important respects. Inordinate depletions raise the pulse, stimulate the arteries even to much throbbing, and produce palpitation and reaction of the heart, whilst unassimilated materials are unduly taken up to supply the deficiency of the circulation.

The direction given to Phaeton will be the best guide to the physician, "*Medio tutissimus ibis.*" When the patient is robust, plethoric, the disease aggravated, and neither age nor other circumstances forbid, the treatment must be vigorous, and decided, but seldom, or ever, severe.

Moderate venesection, and if indicated by local pains, the occasional employment of leeches, associated with the use of purgatives, sedatives, &c., judiciously resorted to in the intermissions, whenever shortness of breath comes on, and as circumstances may require, will ward off the paroxysms for an indefinite period, and keep the lesion long stationary.

As a means of procuring temporary relief, the derivative method of Morgagni, which consists in the use of warm pediluvia, and maniluvia, and in employing whatever can solicit the blood from the heart into the extremities, will often prove highly serviceable. To soothe, by every expedient, mental and physical, is too often the utmost to which the medical man can aspire; yet, whenever he effects this, his labour surely is not in vain.

I have already treated, at some length, of the influence of derangement of the stomach on the respiratory organs;—the same close connection through the nervous medium exists between the heart and the gastric system. Derangement of the latter is no infrequent cause of cardiac disease; and when it is not the cause, it is often co-existent, and tends to exasperate every symptom. I would, therefore, recommend, in some instances, the closest attention to be paid to the digestive functions, before the heart itself is made the object of any direct remedial measures.

Purgatives.—Not a few instances have come under my notice, of the ill effects arising from too copious purgation in cardiac asthma. From the venous congestion co-existing with it, there results a degree of torpidity in the intestinal canal, to remove which the practitioner is often induced to exhibit drastic purgatives. The chief object to be held in view, in administering this class of medicines, is the removal of long retained fœcal matter; and next to stimulate the bowels so as to bring about the due peristaltic action. Another advantage derivable from the operation of purgatives, is their power of removing that state of flatulence which is the ordinary concomitant of asthmatic complications. The proper administration of opening medicine will indeed be regulated by the sthenic or debile condition of the patient. In the former case, the abstraction of blood should precede the exhibition of purgatives. This practice is especially to be observed in the event of any dropsical association. I have seen, in such cases, considerable mischief ensue from the eagerness of the physician to remove the anasarca by copious watery evacuations. This eagerness seldom fails to defeat itself, and to exasperate the evil it would remedy. Venesection to a moderate extent will be less debilitating to a patient affected with dropsy, than the operation of active cathartics.

In asthma connected with dilatation of the heart, serous discharges by the bowels will often aggravate the complaint: and as this is a lesion at times found associated with cases of great debility, everything tending to exhaust the patient should be sedulously avoided. In acute diseases, and when inflammation runs high, the free use of aperients will be highly expedient; and, in conjunction with abstraction of blood, should ever be resorted to. But, in chronic disorders, the contrary holds good. In this case, too great a reliance on evacuants is unwise; since, when not duly regulated, and kept within bounds, they are permanently weakening in their effects. I am, generally speaking, inclined to eschew mercurials in most complications of organic disease of the heart. They possess stimulant properties which render their utility in these affections very questionable; for whenever the heart is involved, the main object should be to tranquillize, and consequently to avoid everything that may tend to accelerate its action.

A mild, and useful hydragogue purgative, for general use, may be composed as follows:—half an ounce of the bitartrate of potash, or cream of tartar, the same quantity of lenitive electuary, and a drachm of jalap powder, to be well triturated in a mortar, and then to be formed into an electuary with syrup of ginger, adding to it a few drops of the oil of peppermint. Of this a tea-spoonful, or more, may be occasionally taken, as circumstances seem to indicate.

A mild aperient, which, should the case require it, may be advantageously employed for a considerable period, without any danger of distressing the patient, may be formed of the crystals of tartar combined with precipitated sulphur. This compound is very gentle in its operation, and while it excites the kidneys, it at the same time promotes healthy diaphoresis.

Drastic purgatives, as colocynth, scammony, black hellebore, elaterium, gamboge, &c., are occasionally administered in various hydropic complications. It is almost unnecessary to point out what injurious effects have often ensued from such a course, before cardiac asthma, with which dropsy is not infrequently found conjoined, had received the light of modern investigation. What has been advanced, with respect to undue abstraction of blood, is strictly applicable to immoderate purgation. It often ultimately increases instead of diminishing the evils sought to be remedied.

Diuretics.—This class of medicines presents the means of removing dropsical effusions without the debilitating results to be apprehended from cathartics. The relief too afforded the patient, through the medium of the renal emunctories, possesses the additional advantage of lessening the quantity, without at all impairing the quality of the blood. By withdrawing in this way the serous portion only of the vital fluid, diuretics, whilst they relieve congestion, do not much interfere with the strength of the constitution. It is this double property which renders them, in many instances, of such safe and efficacious administration.

The mode in which diuretics act is various, and in the case of some drugs classed under this head, it has not been satisfactorily ascertained. Some affect the secreting urinary vessels through nervous communication between these and the stomach, as squills, which would appear to primarily excite this hollow viscus. Others, as the saline diuretics, exercise a direct influence on the kidneys; and others again increase the secreted fluid by promoting absorption. This, indeed, is, in point of fact, indirectly augmented by every other variety of diuretics.

When the venous system is in a state of plethora, it is in vain to look for any advantageous results from the administration of diuretics. Recourse must, in such instances, be had to blood-letting; and when congestion has been thus relieved, the way will be open for the employment of urinary promovents.

Some saline diuretics are, from their additional laxative qualities, especially indicated whenever pyrexial symptoms occur. They lessen all febrile excitement, and do not cause the weakness which follows the use of hydragogues. One of this class I have already mentioned under the head of purgatives, namely, the crystals of tartar.

Tartarized soda, tartrate of potash, acetate of potash, (this last salt may be more agreeably formed by extemporaneously decomposing the carbonate of potash by means of distilled vinegar, or one equally agreeable may be produced by the substitution of citric acid,) and nitre, which, according to Dr. Maclean, appears to promote the flow of urine by a direct specific action on the kidneys, are all cooling and efficacious.

In every dropsical combination, diuretics are of course to be resorted to; and particularly when the urine, being high-coloured and scanty, deposits an abundant sediment. In general, the stimulating diuretics should be avoided; and even when anasarca forms a predominant complication of the disease, the fluid ought not to be eliminated too rapidly. It must also be recollected, that few medicines differ more in their effects than those of the present class. In fact, those commonly esteemed the most powerful will frequently prove less efficient than the weaker diuretics.

By the introduction of digitalis into general and systematic use, Dr. Withering has conferred a signal benefit on practice. The efforts of the physician have been highly aided, and consequently the patient has, at the same time, reaped much advantage. To ensure all the assistance derivable from this medicine, there are several states and circumstances requiring previous consideration; and by pointing out those conditions, under which its administration is unadvisable, the proper times for its use may be readily inferred. In all cases of much visceral derangement, depravation of the habit, or when there are febrile symptoms, and venous congestion is considerable, the digitalis is, for the most part, contra-indicated. Its producing a sense of tension in the head, with functional disturbance of that organ; extreme lowering of the pulse, or when its use is followed by vertigo, indistinct vision, diarrhœa, palpitations, faintness, cold sweats, and delirium, are also signals for its discontinuance. It has been found most serviceable in those cases in which pallor of the countenance, weakness of the pulse, and diminution of muscular energy, exhibit well-marked debility.

Before proceeding to the administration of digitalis, it is necessary to consider under what form it is most advisable to exhibit it; and when its use has been begun the physician should watch with lynx-eyed attention its effects on the circulation, the digestive tube, and the brain. Of the various preparations of the drug, the infusion deserves the preference. It is inferior in strength to the dried leaf; but its proportions can be more delicately graduated, and it becomes a readier vehicle for the combination of other medicines with it.

This last mentioned consideration is a point of much importance. Diuretics are, in general, infinitely more available when combined than when used singly. The same remark, it has already been shewn, is applicable to some other classes of medicine.

Since digitalis, as well as other active remedies, is apt occasionally to lie for a period dormant in the system, and then produce, by its accumulation, the most alarming effects, it is necessary to administer it in small doses, and at long intervals. By duly attending to its operation on the patient, and regulating its employment according to the circumstances of age, sex, and bodily habit, digitalis, powerful as it is, may be employed with perfect security.

Especial caution, however, should be taken to check any effects this medicine may have on the bowels; since its action on them, when it does take place, is sudden, and in general violent.

It is not uncommon to find medical writers ordering a combination of some preparation of mercury with digitalis, or other diuretics, in disease of the heart, but this is a practice which should be followed with considerable caution; the stimulating qualities of this mineral do often, in my opinion, tend to exasperate lesions of the heart. For instance, on looking over a work of some merit, published some years ago, I observed calomel, combined with diuretics, ordered to be taken several times a day; a course which I must consider the reverse of scientific. However useful it may be in other visceral disease, whether chronic or acute, its liberal employment, when the heart is the seat of disease, is ever to be deprecated. The raising of the pulse, and the febrile excitement its occasional concomitants, even when given in such doses as to cause it to pass off freely, contra-indicate its employment in most cases of cardiac disease. The digitalis acts as a sedative, and its general effect is to lessen the force of the circulation. To combine it, therefore, with a stimulant is to endeavour to reconcile contraries. The results of practice, however, do seem sometimes to justify the combination. Dr. Maclean asserts that he has known calomel considerably relieve, or check ossifications of the valves of the heart, if not entirely remove them! Such an observation can only excite a smile.

It may be as well to admonish the patient, that whilst taking diuretics, he should be careful to keep the surface of the body moderately cool. The practitioner is aware that the urine is lessened, whenever the cutaneous exhalants are stimulated by heat; but the non-professional individual, unless cautioned, is apt, from ignorance of the fact, to defeat the purposes of this class of medicines.

Squill forms too important a medicine, from its very general use in dropsical complications, to be passed over in silence. Ancients and moderns have united in recommending it; more especially when dyspnœic symptoms combine with anasarcous. It is of very uncertain operation when used alone; but in combination with other medicines, the effect it is desired to produce can in general be calculated.

In cases of asthma, combined with hypertrophy of the heart, or dropsy, iodine may be tried, but cautiously. It is one of the most active agents on the absorbents as yet known, and is a direct diuretic as well. But when it induces those symptoms, previously mentioned as contra-indicating the further employment of the digitalis, it should be at once discontinued. Iodine ought never to be administered to persons of irritable habit; and, if it should excite perspiration or griping, it ought to be immediately suspended. A milder form of this medicine is the iodide of potassium.

Dr. Cullen speaks slightingly of the power of vegetable diuretics, although he particularizes digitalis in his catalogue. The efficacy of this class of medicines is so dependent on the physical state and idiosyncrasy of the patient, that it is often impossible to pronounce definitively on their respective powers. After the fox-glove and squill, the colchicum autumnale or meadow-saffron, the common broom, juniper, and dandelion seem most to deserve specification.

The best reason I can give for treating at such length on these medicines, has been already so well expressed by Baglivi, that I shall borrow his words, "*pluries adnotavimus, in pectoris morbis, semper ducendum esse ad vias urinæ, naturâ id monstrante.*"

Antispasmodics.—Opium, with its preparations, forms, in some instances, a useful auxiliary to both squill and digitalis. At times it may be used as an anodyne; and at others, it will be found serviceable to stop the purging, which is occasionally produced by the action of those medicines.

In the exhibition of antispasmodics, the practitioner must be on his guard against the re-action which, as in the case of copious blood-letting, will follow their too liberal use. It is only on the approach of a fit in the earlier stages of organic disease, that much benefit can be expected from this class of medicines; and, even then, sedatives are better in combination with other ingredients, than administered singly.

Antispasmodics are particularly available when there exists much general irritation, with suffocative orthopnœa, and a tendency to vomit. Should they procure a short slumber alone, the blessing is at such a period inestimable.

Having previously dwelt, at some length, both on narcotics, and antispasmodics, I shall conclude my observations on this head, by advising a trial, on failure of other medicines, of the carbonate of ammonia, or the spirit of ammonia, with its compounds. They may be given, at times, in junction with ether, musk, or camphor; and will often be found of service in lessening bronchial constriction, as well as other asthmatic symptoms.

Tonics.—I have remarked, when speaking of the treatment to be pursued in the intermission of the nervous asthma, that there are states, in which the administration of tonics is imperative. The efficacy of this order of remedies is peculiarly visible in cases of dilatation, and softening of the heart; and some of the bitter tonics have proved most beneficial in dropsy, connected with such affections. I have alluded to the frequent co-existence of indigestion, both with asthma and cardiac disease; and in such complications tonics are often of the first importance. Their remedial influence, however, depends greatly on the tact and knowledge of the prescriber. The irritation excited by an injudicious use of these medicines, in bronchial disease, has been already pointed out; and when the circulatory system is overactive, with hypertrophy, they increase the organic evil. To prescribe them with effect, requires a thorough knowledge of the structural and functional changes produced in the system by disease; and their exhibition in the various species of asthma is a matter of great delicacy.

Steel medicines, (to the use of which in idiopathic asthma, I have expressed myself unfavourable,) are, generally speaking, the best tonics in those forms of cardiac asthma which warrant their employment. A decided advantage, which they possess, is the gradual manner in which they operate. Imparting, by degrees, tone to the solids, and thereby effecting an improvement in the state of the fluids, they gently restore the enfeebled powers of the animal economy. Of the different preparations of iron, the *ferrum tartarizatum* is one of the most valuable, from its combining diuretic with tonic qualities. It is most advantageously exhibited, conjointly with bitters or some aromatic. Laennec states that aromatics are very often serviceable, particularly the infusion of cat-mint (*nepeta cattaria,*) valerian, balm, and orange-flower. Since Corvisart mentions that he was occasionally in the habit of employing Bacher's tonic pills, his authority tempts me not to pass them over without notice. At one time they were held in high esteem; but they are now little known, and seldom used. I have had no experience of them, but should not be induced, from the ingredients of which they are composed, namely, myrrh, black hellebore, and carduus benedictus, to place much faith in their virtues.

The above distinguished physician speaks in high terms of a bitter and diuretic wine, prepared according to the formula of the Hospital of La Charité, into the composition of which entered Peruvian and Winter's bark, lemon-peel, angelica root, dried squill, wormwood, balm, and juniper berries, all infused in wine. There is no lack of number here. It is a medical olla podrida.

In those cases, in which irritability of the gastric system is present, the milder vegetable bitters, as the infusion of cascarilla, camomile, orange-peel, or of columba, are, at times, advisable. However, the best practice is to endeavour to remove derangement of the digestive organs, by directly relieving the more or less gorged state of the general venous system, to which their impaired condition is owing. Those physicians, who are accustomed to think for themselves, and to apply to nature as the great and only unerring teacher, are aware of the frequency of such congestions, and their cause. The injected state of the capillary vessels of the stomach, and intestines, must be productive of important derangements of the action of these organs. It is essential, therefore, to restore them to healthy activity by general or local bleeding; and should this not suffice to bring them back to their natural functions, tonics may then be administered to correct any debility that may be left.

Corvisart mentions, among the various morbid appearances observed by him in those who died in consequence of disease of the heart, the high vascularity of the stomach. To such extent does this at times proceed, that, as he correctly states, the stomach will be nearly filled with sanguineous clots of a deep red colour, extending also throughout the small intestines. I am induced to dwell upon this phenomenon, with which indeed my pathological inquiries have long made me familiar, principally from its singular importance in forensic medicine; although it is of no slight moment on other accounts.

A very interesting trial occurred some years ago; the parties in which were the Rock Insurance Office, and the executors of a respectable banker. His death had been sudden; and on opening his body appearances were presented, which induced the suspicion that the deceased had made away with himself. More than one hospital surgeon of eminence gave it as his opinion, that the individual in question had taken poison. Their authority would, in fact, have influenced the Jury, had not a young medical practitioner, a former pupil of mine, decided the point at issue by counter-evidence. It was, indeed, obvious to the pathologist, from the detail of the circumstances, that the deceased had laboured under some obstruction to the circulation, whence arose the congested state, and discharge of blood, which had misled the other medical witnesses.

Now the phenomenon, which I have just noticed, may be presented after death from another cause, which, however, produces precisely the same results as cardiac disease, namely, inflammation of the lungs. As an instance of this fact, I may adduce the *post mortem* examination of his late Majesty; and I recommended the considerations I had to make on this subject at the time, to the especial notice of our late honoured President of the College of Physicians.

This congested state of the gastric mucous membrane, and the sanguineous effusion so often found to exist in the stomach, may arise from another origin besides cardiac disease, namely, from pulmonary congestion, or even pneumonia. The mechanism by which such an effect is produced, I have already explained. As an instance of this occurrence, I shall take the liberty of referring to the autopsic examination of the body of his Majesty George IV; in so doing I beg to disclaim any, even the most remote, intentions of animadverting in the slightest degree on the professional character of any of the physicians engaged on that momentous occasion. The case may now be fairly considered as public property, and one in which every medical practitioner is entitled not only to entertain, but to express his own opinion. The interests of science, and the voice of humanity not only sanction, but defend the enjoyment of such a privilege.

From the report made after death to which the name of that truly eminent surgeon, Sir Astley Cooper, was appended; it would appear that this gentleman referred the phenomena presented on dissection to disease of the heart, "which had existed for many years," to use his own words. Such being the case, one cannot help feeling surprise at the medical advisers of his Majesty not having remonstrated against his frequent drives in Windsor forest, in the severest weather, until at length his condition became so very much aggravated, as to confine him to his apartment. It is a fact which must be known to every practical physician, that, on the sudden setting in of cold weather, numbers of elderly persons, labouring under various diseases of the heart, are carried off. This has long been observed in those establishments (at least I have noticed it,) in which the aged are congregated together, as at our noble institutions, Greenwich and Chelsea hospitals. The reason is obvious. Cold at once constringes the cutaneous capillaries, and thus operating on the deep-seated vessels, occasions a congestion, which the heart, now called on to exert additional energy, at a period when time or disease has enfeebled it considerably, is no longer able to overcome. To use a technical illustration, an additional leverage is exerted, and the spring snaps.

Against the above account it may be objected, that dissection furnished evidence of cardiac lesion. The vascularity of the stomach, as I have already remarked, is no proof of the existence of disease of the heart; but what did exist had, doubtless, been called into activity by the unsuspected inflammation of the lungs.

In fine, as no diagnosis was recorded, it is presumable that none was formed, at least none founded on a careful exploration of the chest by auscultation and percussion. The evils, resulting from such omission, may be conjectured from the preceding remarks.

By way of corollary to the above, and as an example of how confined the knowledge of pathology is, or else of its difficult acquisition, I may mention that about two years previously to the demise of his Majesty, I had had some preparations made, at a considerable expense, faithfully imitating the stomachs of persons who had died of the consequences of cardiac disease. These preparations were shewn by the modeller to some of the most eminent in the profession, and, in one case, to a gentleman who, he stated, was preparing to publish a work on the morbid appearances of the stomach in individuals destroyed by poison. They all pronounced the subjects, from whom the preparations were modelled, to have lost their lives by poison, or some acrid substance taken into the stomach.

In the report of the dissection of the body of his Majesty, it is stated that the immediate cause of death was the rupture of a blood-vessel in his stomach. To this I can give no credence. The effusion was, I make no doubt, poured forth from the muco-villous coat of the stomach. It is generally supposed that the *vasa brevia* supply a channel for sanguineous congestions by the communication they furnish with the splenic end of the stomach; but in addition to this passage, I believe the vascular pores of this organ itself must facilitate the escape of effusion. This, however, is contrary to the opinion of Corvisart, who supposes that the liver unloads itself of its accumulated blood, through the intervention of the hepatic arteries and veins, and the pori biliarii, into the hepatic duct, and that the fluid conveyed by this means into the beginning of the duodenum, may, in part, flow back into the stomach. Now, frequently as I have examined the hepatic duct, both before and since my acquaintance with Corvisart's work, I have never been able to detect the presence of any sanguineous collection there.

The course of the disorder which terminated his Majesty's life seems to me briefly this; and I ground my opinions on the few hints to be gleaned from the President's bulletins, and the details of the examination after death. Cold, I conceive, induced inflammation of the lungs, which was latent, but could have been readily discovered by an experienced auscultator. The absence of cough, till within a few days preceding his demise, by no means invalidates the above supposition, as experience has fully shewn me; and the difficulty of breathing, so often mentioned in the bulletins, tends to confirm it.

Consecutive hydrothorax first occurred in the left side of the chest (between two and three quarts of water were found after death) and the compression of the lungs, produced by this effusion, might, in some degree, mask to the inexperienced, the auscultative signs of pneumonia. Had bleeding been seasonably employed, effusion could scarcely have occurred; and, as a proof of the inestimable value of auscultation, I must beg especial attention to the fact that venesection, judiciously employed, might not only have prevented the deposition of water in the chest, but had it been again resorted to at fitting periods, it would have obviated the sanguineous effusion from the stomach. This latter, indeed, arose from the general venous congestion brought on by the compression of the lungs just noticed.

Many remedial agents might be named, in addition to those already noticed. Derivatives, as sinapisms to the extremities, with vesicatories, and rubefacients; gentle emetics, &c. may be occasionally tried, as the symptoms indicate. I have already treated so fully on the various classes of medicine most serviceable in asthma, and its other complications, that to enter upon their properties and effects here would be to fall into fatiguing repetition. The rules, for diet, laid down under the head of Nervous Asthma, may be consulted with advantage as respects the cardiac variety; and, in conjunction with what I have previously said in my general observations on disease of the heart, will supply the most important rules for the dietetic treatment. Abstemiousness in food, rigid renunciation of stimulating liquors, and, above all, peace of mind, are indispensable to ensure the chances of recovery in all affections of the heart. It is in these that the physician must add to the routine of his art, the higher offices of the philosopher, and the Christian. Without a knowledge of the world, and the workings of the human bosom, he will be incompetent to counsel; without that faith, which alone "makes wise unto salvation," he will be unable to soothe, strengthen, and console; and he who has not those qualifications which enable him to become the moral teacher and the friend, may, in the majority of these diseases, as well "throw physic to the dogs" as prescribe for the body when it is the vassal of the mind.

CASE OF ASTHMA, COMPLICATED WITH DISEASE OF THE HEART.

The Honourable Mr. H., aged 22, first came under my care several years ago. He had for some time been a sufferer from occasional fits of spasmodic breathing; and since they increased in intensity, there was an apprehension that the asthmatic diathesis would be confirmed in him. He was tall, and apparently well made: and had been attended by the medical advisers usually employed at the great public school he had recently left, without the slightest suspicion on their part of the existence of any malformation. On examining his chest, I was immediately struck with the disparity exhibited by its two sides. The left was so contracted, that there was a difference of fully two inches between it and the right. I was unable to ascertain whether he had ever had any pleuritic affection of this side; but I am strongly inclined to believe that some effusion must have taken place there; and that this, after having been deposited for some time, was at length removed through the power of absorption.

If this surmise be correct, the lung of the same side must have undergone compression; and when the obstacle to its due expansion had been removed, it would, through the effects of long pressure, be incapable of resuming its natural size. The other lung, as is generally the case, when the functions of its fellow lung are interfered with, became voluminous; and this was indeed evident to the eye by the rounded figure of the right side.

Percussion yielded, on the opposite side, a dull, and, in part, a fleshy sound, more particularly on the lower, and lateral parts. The respiratory sound in the same parts was extremely indistinct; and over the remaining region of the affected side weaker than natural. The bony compages of this side of the chest too were contracted exactly in the same manner as is observable in pleuritic cases, in which the walls of the chest follow the retrocession of the spongy parts, as the effusion is absorbed. From the above physical signs, conjoined with the pathological experience I have had in this disease, I might almost pronounce definitively on the pre-existence of some pleuritic affection. The practised physician is aware how extremely variable are the symptoms of this disease, how furtive its progress; that the pain arising from it is so immaterial as scarcely to arrest the attention of the patient; and that, generally speaking, few affections so well deserve the name of latent.

Owing to the undue enlargement of the right lung, as well as to a degree of bronchial irritation, the spasmodic breathing, from the acuter attacks of which the patient was beginning to suffer, had been, perhaps, produced. The heart was partially displaced through the voluminous condition of this lung; and this partial obliquity had given rise to hypertrophy conjoined with dilatation of both ventricles. These states, of course, arose from the obstruction thus caused to the free passage of the blood into the pulmonary artery, as well as into the aorta. They were fully indicated by auscultation. The contractions of the ventricle on the left side, and its strong impulse, were distinctly recognisable between the fifth and seventh ribs, instead of between their cartilages. On the right side, the impulse of the ventricle was more perceptible towards the left of the inferior part of the sternum than is usual. Indeed, from the obliquity of the heart, he was affected nearly in the same manner as a person labouring under congenital narrowness of the aorta and pulmonary artery. In consequence of this state, there would be, I need hardly observe, congestion in the lungs, as well as in the right side of the heart, and its venous trunks. From the nature of the impulse, I am of opinion, that the heart had acquired, at its apex, an unusually rounded form. I must also mention that the sound given out by the auricles was very sonorous, and that the action of the heart altogether was perceptible over a much more extensive space than natural, pulsation being heard even in the posterior part of the right side of the chest. Sub-lividity of the face, and coldness of the extremities, were occasionally manifested.

The patient explained to me that he could in general predict an attack from his feelings the evening preceding a seizure, although they did not amount to absolute oppression. When admonished by this undefinable sensation, he usually retires to bed with a full presentiment of the impending evil. About four or five the following morning, he is awaked by the ingression of the fit. This usually lasts two or three hours; and on its subsidence he falls asleep. The symptoms on his re-awaking vary. At times he is enabled to rise without any trace of the disease remaining. At others, a recurrence of the attack will take place; while at others, again, he will suffer the remainder of the day from the same dull head-ache, and sense of stupor, which are left by fearful dreams, or attacks of night-mare. During the continuance of the fit all inclination to eat entirely deserts him; although one of the symptoms, when first he became subject to these attacks, was, to use his own phrase, a furious appetite. The character of the attacks, he states, is now much altered. At first they were very violent, but of short duration. They are, at present, much milder; but will return for three or four successive nights. Bleeding he conceives to afford him the most relief; sometimes emetics: and at all times he finds the passing of water, which is habitual to him in the course of an attack, productive of much ease. Occasionally considerable sickness, with violent retching, and a copious dark-coloured and bitter discharge will accompany the asthmatic paroxysm; and at times a sense of extraordinary debility will be the accompaniment of a fit.

Whilst suffering, the symptoms perceptible differ very little from those consequent to the pure form of asthma. The murmur of inspiration is weak, and in part suppressed throughout the right lung; and auscultation gives similar results over the summit of the left. In the remaining portion of this same lung, the respiratory murmur, usually feeble, is somewhat augmented. The râle sibilant, or a clicking as of a small valve, is heard during a full inspiration, and at times during the expiration; whilst, in the latter, that singular phenomenon, which I have described at page 246, is clearly defined in the right lung, and obscurely indicated in the left.

When labouring under an attack this patient does not seek relief from the posture usually assumed by the asthmatic, but maintains an erect position. The enlargement of the right lung compels him to this; and again, were he to lean forward, the heart's action, already impeded, would be still further embarrassed.

I should observe that the portion of the chest directly in front of the heart projects, and exhibits an unusually strong impulse; although as I have before explained, the left side, compared with the right, is considerably contracted. Indeed, this projection over the seat of the heart is generally met with in all cases of enlargement of that organ, when the patient is young.

At the period of life at which my patient had arrived when I first prescribed for him, that is, just entering on manhood, there is usually a pre-disposition to fulness of habit, which permits moderate depletory measures, without risk of reducing the constitutional energy. I was thus enabled, after no very long period, to moderate the symptoms of his disease, by lessening the sanguineous fluid, and thus allow him to enter the University; the fear of the propriety of which step had first induced his relatives to consult me.

The predisposition to asthma, in the case of this gentleman, is, as very commonly happens in dyspnœic complaints complicated with cardiac disease, hereditary. There has thus been much to struggle against; but the vantage-ground has been gained, and perseverance on the patient's part must effect the rest.

I afterwards had the pleasure of receiving a letter from one of his nearest relatives, who writes of him as follows:—"I am thankful to say he appears to have realized your encouraging predictions, and to be outgrowing the tendency to irregular action of the heart. Still his health is far from strong; and he is liable to suffer from oppression of breathing, and the usual unpleasant train of symptoms, after any imprudence in diet, exposure to cold, or in damp weather."

ON DISEASES OF THE HEART

IN GENERAL.

Having already given a sort of general outline of the most prominent points of cardiac disease, more immediately connected with the appearance of asthmatic symptoms, I shall now enter more fully into the subject of diseases of the heart, as several of the symptoms known to usher in organic affections of the great organ of the circulation are totally unconnected with asthma, and consequently require a distinct and separate consideration. The necessity of this more minute examination will be at once apparent, when I state that I now intend to present a succinct view of the principal diseases to which the heart, in its several structures or parts, is known to be liable.

General Symptoms.—The great protection which the heart enjoys from the situation in which it is placed, would lead one to believe that it must be exempted from the influence of those causes of diseases, which are constantly menacing the other, and less important, viscera of the body. A little reflection, however, will satisfy us that we need not be surprised at the frequency of diseases of this organ; we must recollect that from the first moment of existence, till the last throb of exhausted vitality, it is doomed to feel a greater or less shock from every, the least disturbance, whether functional or organic, which the system may undergo, and that there is not a passion of the mind, nor a movement of the frame, which does not exercise a greater or less degree of influence on the function of this organ. Hence it is that all those causes which are effective in producing other diseases, are more or less influential, whether directly or indirectly, in giving rise to functional disturbance, and eventually to derangements in the structure of this organ. I feel I cannot introduce more appropriately my remarks on its diseases, than by laying down, in as succinct a manner as I can, the *general* symptoms which usher in and accompany the diseases of the heart. Before doing so, I beg leave to remind the reader, that however important these symptoms may be individually, and in themselves, it is only when they are combined in a considerable group, that they can be deemed of sufficient value to warrant the practitioner in awarding to them that degree of importance whereby to enable him to decide on the existence of cardiac disease.

There are certain common symptoms almost always observed in all diseases of the heart, and in the existence of which they may be all said to agree. We may, in the first place, refer to the appearance of the countenance. Attention to this point will often prove valuable in these diseases. In the incipient stage the countenance scarcely undergoes any change; but as the disease progresses, the case is otherwise. In persons, more especially females, of a sanguineous temperament, momentary flushings of the face are observed to occur—the countenance also usually becomes bloated and purplish; the temperament, however, will influence this appearance, as if it be lymphatic, the bloatedness is accompanied with paleness. The jugular veins will also, in many cases, give useful information with respect to the state of the heart; when this organ is the seat of disease these vessels become prominent; they are sometimes observed to pulsate; the pulsations of the heart itself, as well as of the large vessels in its vicinity, frequently become perceptible to the eye; the form of the chest itself, more particularly towards the cardiac region, will undergo modification from the presence of organic disease of the heart; this region will bulge out, as it were, and present that peculiar rounded aspect characterised by the French by the term *bombée.* Another symptom found to be more or less characteristic of cardiac disease, is a feeling of distress about the region of the heart, attended with palpitation, which is readily excited by mental emotion, or on being suddenly aroused from sleep. The breathing is at once hurried by any excitement of the mind, or by bodily exertion—it is, moreover, found to be short and difficult, especially on ascending an acclivity, or assuming the horizontal posi-sition.

The patient's sleep is frequently broken and disturbed by frightful dreams; he is forced by an indescribable sort of restlessness frequently to change his position in the bed, from one side to the other. As soon as the disease has made progress, it is at once recognised; the patient is now no longer able to lie down—he is observed to assume a sitting posture day and night, with some inclination forward, so that occasionally the abdomen presses against the thighs. Pains are felt in the stomach, and efforts are made to vomit, along with various other dyspeptic symptoms—all referrible, no doubt, to the state of congestion, or, according to Andral, to subacute inflammation in the stomach (as well as in the other internal organs), and occasioned by the obstructed circulation. The eye loses its wonted expression—becomes watery, indicative of distress, and prominent—the under lid becomes swollen, and the complexion now assumes a pale, leaden, and sometimes a purplish cast. Œdema of the lower extremities, and subsequently of the other parts of the body, is now seen to supervene; such is a brief outline of the general symptoms characterising all cardiac diseases. Corvisart, in enumerating the various signs of cardiac disease, describes the modifications, which the several functions of the circulation, respiration, digestion, and secretion, undergo in this affection. In my remaining observations on the general symptoms, I shall adopt a somewhat similar arrangement, commencing with the important function of respiration. It may be observed that one of the earliest symptoms of cardiac disease is a certain degree of dyspnœa, which goes on increasing with the disease until at length the patient cannot accelerate his step in walking for one moment, nor even attempt to ascend an acclivity at a slow pace without augmenting his difficult breathing to a painful extent.

Kreyssig well observes on this symptom that there is one peculiarity in the dyspnœa of cardiac patients; namely, that in some it is constant, and in others, intermittent; the latter being accompanied with symptoms of suffocation. It is not a little curious that this feeling of dyspnœa is far more distressing in disease of the heart than it is in some of the most serious affections of the great respiratory organ itself, viz., the lungs: a patient labouring for instance under extensive pneumonia, when interrogated as to his symptoms, scarcely ever alludes to dyspnœa, whilst the Cardiac patient complains of it from the very commencement. This difficulty of breathing is influenced, moreover, by the position of the patient in bed. To this circumstance, however, I have already alluded; to these remarks, on the influence exercised over the respiratory function by disease of the heart, may be added a certain feeling of distress, accompanied with a disposition to syncope, and paroxysmal returns of dyspnœa. After some time the mind of the patient becomes painfully sensible of the state of incessant suffering in which he is placed. As may be inferred, *à priori*, from the imperfect manner in which the circulation is carried on, the parts remote from the heart become very cold, whilst œdema attacks the lower extremities; the countenance assumes an appearance readily recognised in the cardiac patient—it is sometimes puffy and pale—sometimes purplish; it evinces a sort of wildness of look not to be mistaken. Among many of the other symptoms, it may be right to mention gangrene of the extremities as one of occasional occurrence; another, destruction of the eyeball, has been set down as one of the sequelæ; but I never witnessed such a result. Among some of the most common symptoms of cardiac disease may be considered a strong disposition to hæmorrhage, which may take place through the nose, lungs, intestines, or even by the bladder. There appears to be some ground for the opinion that this is a method adopted by nature for the purpose of relieving the circulation.

These various phenomena now described differ according to the side of the heart which may happen to be the seat of the disease. When the right side is affected, the lung is the organ that generally feels the effects, either too much or too little blood being conveyed to it in consequence. In either case a difficulty of breathing will happen; this symptom is observed to go on increasing progressively; whilst dyspnœa, occasioned by cardiac disease seated in any other part of the organ, generally comes on in paroxysms, and thus allows the patients some intervals of ease, during which they seem to be perfectly well. Among the effects of diseases of the right side of the heart on the lungs, may be mentioned cough, spitting of blood, and various irritations of the lungs; to these may be added reflux into the venæ cavæ, and pulsations of the jugulars; this distended state of the venous system extends still further into the internal viscera; thus we frequently observe in such cases great dizziness, actual headache, and pulsation within the cranium. In the recumbent posture this latter symptom is much exasperated, which accounts for the sleeplessness so often complained of in this affection. It is by no means improbable that this deranged state of the circulation within the head, will account for the convulsive symptoms exhibited sometimes by patients labouring under disease of the right side of the heart. To the same condition of parts also may be referred the sense of creeping, numbness of the limbs, as well as a feeling of somnolence; the stomach also becomes occasionally the seat of venous congestion from the same cause; this will give rise to various dyspeptic symptoms; hæmorrhoids and varices are another consequence of the same morbid state.

As has been already observed, when the left side of the heart is the part affected, the dyspnœa is paroxysmal; in this case also it is that the feeling of distress and of constriction, so very characteristic of this disease, is chiefly complained of.

These general symptoms, now enumerated, are, when separately taken, very deceptive with respect to diagnosis; it is only when combined that they can be made available for practical purposes.

CAUSES OF CARDIAC DISEASE.

The causes of cardiac disease, as of most other affections, may admit of different arrangements, according to the point of view in which we look at the subject. I shall, for the sake of greater clearness, consider them as Monneret has done, as they reside—1st. in the heart and organs of circulation; 2. in the blood; 3. in the lungs; 4. in the nervous system;

5. in the organs connected by sympathy with the heart; 6. those causes arising from the surrounding media, and dependent, more or less, on hygienic circumstances.

Under the first class of causes may be placed disproportion between the size of the heart and the diameter of the aorta; to these we may add an attenuated state of one or both sides of the heart—these are congenital. Inflammation of the covering and lining membranes of the heart may also have the effect of producing organic change of structure on the organ itself, as in the case of inflammation of the pericardium and endocardium. Under the same head we may place hereditary predisposition, the influence of which is undoubted. With respect to the second class of causes, those, viz. which are seated in the fluid circulating through the heart, it may be observed that either an increase or diminution in the quantity of the blood invariably has some connexion with the action, and ultimately with the health of this organ; thus in either of these cases a *bruit de soufflet* will be heard. The *quality* of the blood in reference either to its thinness or the opposite state, is known to be productive of the same sound; we are accordingly warranted in supposing that other changes in the quality of this fluid may also give rise to morbid changes; there are some grounds for believing that the entrance of certain gases into the circulation may interfere more or less with the contractility of the heart, and thereby induce disease. The effects of *age* on the structure of the heart and its membranes are well known. The ossifications produced on the valves of this organ ultimately lead to its hypertrophy or dilatation. Perhaps it may not be out of place here to remark on the influence of *sex* on diseases of the heart; I shall merely say that males are considered more liable than females to diseases of this organ; the reason assigned is, that the former are more exposed than the latter to those influences, which act directly or indirectly on this organ. This matter, however, comes rather under the head of the *moral* causes to be considered presently. In considering in a general way the relative liability of the right and left sides of the heart the prevailing opinion is, that the latter is more frequently diseased than the former; and the reason assigned for this is, the more stimulating nature of arterial blood. It cannot be denied that narrowings and other morbid changes are more frequent on the left than the right side. Among the next or third class of causes to be considered are those which have their seat in the lungs. These may be said to produce their bad effects by causing an impediment to the action of this organ; among the most prominent of the diseases which interfere with the heart's action may be set down hooping-cough, pneumonia, bronchitis, phthisis, emphysema, &c. The *modus operandi* of these causes is sufficiently obvious; in all such cases the lung receiving the blood with a certain degree of difficulty, the heart is forced to struggle against this impediment, and to make more forcible contractions for the purpose of propelling the blood to its destination.

We next come to the consideration of those causes which are more or less connected with the nervous system; these are for the most part identical with what have been called *moral causes.* Among these may be set down the depressing passions, as grief, anxiety, constant fear, shocks, &c.; their effects are at first functional, but eventually the structure of the organ becomes compromised. Persons long labouring under the influence of much mental suffering arising from grief or bodily hardships of protracted duration are occasionally observed to exhibit all the signs of cardiac disease. Hence the term *heart-broken* ordinarily applied to the afflicted becomes more than a mere figurative expression. Sudden and excessive joy has been known to occasion death by causing rupture or paralysis of the heart.

It was observed by Corvisart that acute diseases oftentimes lead to organic changes, not only in the organ primarily affected, but also to those of organs connected with it either by proximity or by sympathy. It is in this way that we may account for the occasional occurrence of inflammation of the investing membrane of the heart, as well as of the membrane which lines its interior, consecutively to inflammation of the serous membranes either of the chest or abdomen. It is a well-established fact that some connexion exists between articular rheumatism and pleuritis on the one hand, and pericarditis and endocarditis on the other. In the case of pneumonia the inflammation sometimes extends to the heart or its covering. Where the scrophulous or cancerous diathesis exists, the heart has been found to suffer—tubercle also has been detected in it. I have already adverted to the opinion expressed by Corvisart, viz. that the vegetations sometimes existing in the valves of the heart are connected with a syphilitic taint. The correctness of this idea has been very justly disputed. In order to render the enumeration of the causes still more complete, I shall present a classification of them into *predisposing* and *exciting*. This will necessarily involve some repetition. Among the former may be placed—1st. Its incessant action from the first moment of existence till the termination of life. 2. Its close and extended sympathies with all parts of the body. 3. Hereditary liability. 4. Rheumatic or gouty diathesis. 5. Temperament, irritable and sanguineous. 6. Plethora or obesity. Among the *exciting* causes, some are considered as *mechanical*, as tight-lacing, leaning against a desk, which subjects the ribs and sternum to be compressed. To these may be added gibbosity. Another variety of exciting causes are the *physical;* such as exposure to cold or damp—violent muscular exertion—blowing into wind-instruments—frequent running against the wind — another variety contains the *moral* causes already noticed.

It may be well to observe that disease existing in any of the abdominal viscera, more especially the liver, may by interfering with the normal action of the diaphragm, derange the functions of the heart, and ultimately produce change of structure. It is but natural to suppose that an enlarged spleen may occasion the same effect. Another exciting cause of cardiac disease is gout, an attack of which will often be followed by a simultaneous relief of the heart itself. The repulsion of cutaneous eruptions has been set down as an exciting cause of heart disease. The *modus operandi* of this cause does not appear very obvious.

With respect to *atmospheric influences* in the causation of cardiac diseases, I deem it but right to state that I fully concur with Bouillaud, in believing that this point of physical ætiology has not received that meed of attention to which its vast importance entitles it. Every day's experience presents to us cases of pericarditis, under precisely the same atmospherical conditions which give rise to pleuritis, acute rheumatism, and endocarditis.

This enumeration of the various causes of diseases of the heart, may justly be charged with being imperfect, if I did not add, that several affections of this organ may become the occasional causes of others. Thus, for instance, according to the above distinguished physician, narrowing of any one of its orifices may give rise to *dilatation* of the cavity behind it. Violent palpitations may occasion rupture of one of the carneæ columnæ, or of a valvular tendon, or even of the parietes of the heart itself.

After what I have already said on the symptoms accompanying cardiac disease, it will scarcely be deemed necessary that I should impress on the mind of the reader the imperious necessity of rigidly adhering to the strict rules of regimen; it is well known how much an over-distended stomach will interfere with the regular action of the heart; a constant repetition of such irregularities cannot be without serious consequences to this organ.

DIAGNOSIS.

This is to be formed both by observing the ordinary symptoms, and also by the physical signs. Though the former symptoms have been already presented to the reader in considerable detail, I shall, for the sake of greater perspicuity, take a cursory view of the more important of them, and endeavour to ascribe to them their due value in establishing the general diagnosis of cardiac disease. These symptoms may be conveniently divided into those immediately arising from the heart itself—as palpitation, pain, and abnormal or irregular action, and into those presenting themselves through other organs or parts, as dyspnœa, hemorrhage, and dropsy.

With regard to the value of palpitation as a diagnostic sign not a little difficulty exists. I may, however, lay it down as a safe rule that when the palpitation is slight and transient in its duration, and its cause is obviously a moral one, the disturbance is but functional; whilst, on the contrary, if it be strong, frequent, and of considerable duration, the great probability is that the disturbance is of organic origin. By attending to the causes of palpitation, we shall often be enabled to determine its value. It is necessary to observe, however, that, even though the cause be of a moral nature, if the resulting palpitations be violent and continued, there is some reason for suspecting the affection of the heart to be structural. We may state with safety that the danger to be apprehended from palpitations will, in general, be found commensurate with their duration and violence. It has been laid down as a diagnostic sign that, in those cases where the heart's action is perceptible to the patient, the affection is but functional; whilst in the instances where the patient does not feel it, the cause is organic. This I am thoroughly convinced is entirely erroneous. It is well known, that palpitation is frequently connected with gastric derangement; in such cases, however, it is only after considerable intervals, that it is perceived to come on, the heart's action being perfectly regular during the intermission. Such irregularities will be relieved by correcting the state of the digestive organs. Palpitation may depend on the presence of a high degree of morbid sensibility. This state occurs most frequently in young chlorotic females. It has been stated that nothing is easier than to diagnose the nature of such palpitations; they occur whilst the patient keeps herself in a perfectly quiescent state; whilst those of organic origin are tranquillized or relieved by rest. The truth of this diagnostic sign I am very much disposed to question. The chlorotic subject is, according to my experience, just as liable to have her palpitations brought on or aggravated by bodily exertion, as the patient labouring under actual and decided structural disease; and, moreover, there is one circumstance which diminishes very considerably the value of this sign, and which the practitioner would do well never to lose sight of; it is this, that after the heart has been a year or two subject to palpitations, which were originally of a purely nervous character, more or less of organic change must eventually supervene. Whilst on the subject of chlorosis in connection with cardiac disease, I may introduce here the substance of a remark made by Andral, in the correctness of which every experienced practitioner cannot avoid concurring. In the chlorotic patient, according as the blood becomes impoverished by losing its normal proportion of fibrine, which state is accompanied with considerable debility, the pulsations of the heart attain increased energy, and yield an impulse sufficient to induce the suspicion of actual hypertrophy. The fact is, that in these cases the nervous system acquires a certain degree of predominance, and under the influence of this neurosthenic state the contractions of the heart become increased in intensity. The increased impulsion of the heart, in such cases, is a consequence of the disturbed innervation, which is itself connected with the attenuated state of the blood, just as we see violent convulsive symptoms as well as increased exaltation of the sensibility come on after severe losses of blood. It is scarcely necessary to notice the vast amount of mischief which may result from the employment of antiphlogistic measures apparently indicated by the partial hypersthenic state, the general asthenic condition with which they are connected being entirely unheeded; the adoption of such treatment would be sure to augment the original nervous affection. In such a case the best mode of removing the nervous state of the patient is by the adoption of a tonic treatment, for which purpose the preparations of iron have been found most effectual. Another observation which I deem it right to make in respect to chlorosis, though it may not perhaps be exactly in place here, is, that in persons so affected the lungs acquire an increase of volume, which must necessarily interfere more or less with the regular action of the heart. The close connexion between the heart and lungs will at once account for this effect.

In the case of attenuated or impoverished blood there is observed a sign which is now deemed characteristic of the cardiac disease having a nervous origin; it is a modification of the bellows' sound. This sound may be occasioned, at least in some measure, by the attenuated quality of the blood; another cause may be the dilated state of the chamber, and which now contracts on the impoverished blood. It may be well to remark, that, in females so circumstanced, the normal proportions which should exist between the capacity of the heart's cavity so dilated, and the outlet leading from it, become, for a time at least, destroyed. This state may further contribute to the production of such sound. In nervous anemic persons other abnormal sounds are heard in the cervical region; these are generally believed to reside in the veins of the neck, their efficient cause being supposed to be the thinned quality of the blood as it descends in its course through the veins. This condition of the patient is most effectually relieved by the medicines already mentioned, namely the preparations of iron.

By attention to the position of the patient we are told that we may derive some aid in distinguishing between structural disease of the heart, and functional disturbance of that organ. It is said that when the disorder is purely functional, the patient may rest indifferently on the right or left side; whilst in the case of structural disease the patient is supposed to lie with most ease on the right side. For my own part, I must confess, I do not attach much importance to this as a diagnostic sign.

It has more than once happened, that a physician called in to see a patient with cardiac disease, labouring under a gorged and enlarged state of the liver or some other abdominal viscus, has mistaken the hepatic affection for an original disease of the liver, and has adopted a plan of treatment accordingly; whilst, had he taken the pains to investigate the history and course of the disease, he would have found that such engorgement, as well as the accompanying dropsy, was but a consequence of the disease of the heart. The anatomical relations of the organs concerned at once explain these phenomena. By reason of the disease of the heart, the inferior cava is no longer capable of emptying its blood into the right auricle; the effect of which is, the liver becomes congested and at length considerably enlarged. Should there be in this case pain on pressing the hepatic region, the incautious practitioner may be led into the adoption of a course of antiphlogistic treatment, such as bleeding, &c., and thereby exhaust his patient, and thus accelerate the fatal termination.

PROGNOSIS.

The very desponding manner in which the older pathologists speak of the more than probable termination of diseases of the heart, would be calculated to lead the practitioner into the belief that the investigation of these affections, could have no other object than to gratify the curiosity of the pathologist, without leading in the slightest degree to the hope of attaining any one point of practical utility. Even the great Corvisart's work on diseases of this viscus, excellent as it must be considered for the time at which it appeared, held out but a very cheerless prospect to the inquiring physician with respect to his being able to accomplish that which should be the ultimate end and aim of all pathological research, namely, the alleviation and cure of disease. Thanks, however, to the untiring and successful labours of the immortal Laennec, and of those eminent men, who have since his time endeavoured to tread in his footsteps, the diagnosis of the diseases of this all-important organ has now been rendered comparatively easy, and the various changes which it is liable to undergo have been brought in a great measure within the ken of our senses. And, though we cannot, unfortunately, apply with strict truth to the diseases of this viscus the old adage, that the knowledge of a disease is one half its cure, still it must be admitted that the aids afforded to cardiac diagnosis by percussion and auscultation, in the treatment of heart-diseases, cannot be too highly appreciated. For though it may not, in every instance, guide the physician to the measures of treatment likely to be successful in accomplishing a cure, it will in almost every case lead him to an understanding of those conditions of the organ which are within the reach of amelioration by medical treatment, and of those states which are entirely beyond the limits of remedial art. To the experienced practitioner—such knowledge will by no means appear trivial or valueless. Any attempt to impress on the profession the urgent necessity of becoming acquainted with those discoveries attained by modern science, in diagnosing the morbid affections to which the organs contained in the cavity of the chest are liable, would be deservedly considered out of place on this occasion. Equally futile must it be deemed to endeavour to point out the great importance of those organs in carrying on and maintaining the various functions essential to animal life. With respect to the heart, when this viscus is rendered, in consequence of disease, unable to discharge its ordinary functions, the vital fluid no longer undergoes those changes essential to its health; the action of the lungs is deranged, these organs no longer impart to it those vivifying properties necessary to maintain the frame in a healthy condition; the embarrassed breathing then produced reacts on the heart's action; to adopt the idea of Corvisart, that mysterious but real chemistry to which the blood is subjected in the normal state, no longer obeys the ordinary laws in the attraction and repulsion of its elements; the vital fluid thus deteriorated becomes an imperfect stimulant, both of the heart itself, as well as of the brain and the other viscera. This distinguished physician earnestly recommended the latter considerations to those physiologists, who, in diseases of the heart, can see nothing more than a putting out of order of a mere material machine, and in the symptoms accompanying these diseases, nothing more than the consequences of such disturbances.

With respect to inflammatory affections of the heart and its appendices, the modern improvements of diagnosis will enable him to bring them under treatment earlier, and thereby afford a more favourable result, than when these affections have remained undiscovered till the organ reached the stage of structural alteration; and in the case of such a lesion, even though a cure may be unattainable, yet a knowledge of the precise nature of the organic change will enable the physician so to apply his therapeutic means as to prolong existence beyond what the older physicians could have ventured to anticipate.

I shall not here attempt to follow Corvisart in his perhaps lax use of the term *organic*, as applied to the diseases of the heart. Understanding that term in the sense in which it is ordinarily used by the pathologists of the present day, I shall, in conformity with Bouillaud's mode of viewing the matter, lay it down as universally admitted, that the structural diseases of this viscus, which experience points out as almost inevitably and immediately fatal, are ruptures of the parietes of the heart, and the sudden coagulation of the blood circulating in its cavities, as occasioned by lightning, peculiar poisons, blows on the epigastrium, &c. There are other diseases of this organ whose fatal termination is equally inevitable, but which hold out a hope of having their mortal career suspended for some time by judicious treatment; these are ossifications of the valves with contractions of the corresponding orifices; to these latter we may add certain cases of chronic carditis and pericarditis. There are other affections of this viscus very dangerous, no doubt, but yet less commonly fatal when subjected to correct treatment, than Corvisart was disposed to think; among these may be set down acute cases of carditis, or of pericarditis and its frequent accompaniment endocarditis. The other affections of the circulatory centre, which experience proves not to belong strictly to the class of diseases necessarily fatal, are hypertrophy unaccompanied either with dilatation, considerable contractions of the orifices, or serious lesion of the valves—simple hypertrophy of the latter without much obstacle to the circulation—adhesions—fibrinous or cartilaginous deposits on the pericardium;—these latter diseases, when they are fatal, are but accidentally so: inasmuch as with strict attention to hygienic and dietetic rules, life may be prolonged to a considerable length, notwithstanding their presence. The greater number of patients who die of diseases of the heart than of those who fall victims to several other organic diseases, may be ascribed in part to the vast importance of the functions assigned to this organ, and partly to the circumstance that its action is necessarily perpetual, and no repose can, compatibly with the continuance of life, be granted to it, whereby it may recover itself. Dilatations of the heart connected with serious losses of blood, as well as simple hypertrophy depending on great muscular exertion, together with purely nervous and symptomatic affections of this organ, hold out, under judicious treatment, every prospect of complete recovery.

TREATMENT OF DISEASES OF THE HEART IN GENERAL.

If there be any organ in the body, the diseases of which require to be thoroughly understood, in order that a judicious method of treatment may be adopted, that organ is the heart. The difficulty of presenting any general view of treatment with respect to the diseases of a viscus, whose functions are of so much importance to the well-being of the entire system, and the affections of which either depend on, or are connected with, such various and even opposite states of the œconomy, must at once be obvious. Hence it is that any observations I may here make on the treatment of cardiac disease in the abstract, must necessarily be of a very general character, as I am obliged to reserve what I have to say on this important subject, till I come to consider in detail the individual affections of this organ.

In undertaking the treatment of a case of disease of the heart, it is of the utmost importance, that the physician should make himself thoroughly acquainted with all, even the minutest details concerning it, both as regards its past history, and also in reference to the actual state of the patient at the moment he may be called in. In other words, a careful diagnosis should be formed. The necessity of conforming to this precept is demonstrated in every day practice.

Do we not constantly meet persons of a nervous temperament, and more especially chlorotic females, complaining, among other symptoms, of violent palpitations of the heart, and who are subjected in consequence to repeated venesections, and other severe antiphlogistic treatment, when the employment of tonics is the practice clearly required? Whilst on the other hand, nothing is more common than to see individuals labouring under an acute affection of the heart treated with tonics, or at least with mere palliatives, and thus the time is suffered to pass by, when and when only the patient might be saved by the early employment of active depletion. Such errors are decidedly the result of incorrect diagnosis in the first instance.

In conducting the treatment of cardiac disease two principal indications must be kept in view: first, to check the morbid process, whether of an inflammatory or other kind, which constitutes the disease, or leads the way to the development of future mischief, and secondly, to remedy or relieve the morbid consequences produced by mechanical obstacles in the circulation, whether such obstacles exist in the heart itself or in the other viscera. In the former case the treatment is curative, in the latter palliative. In illustration of what I have now stated, I shall suppose a case, wherein unequivocal symptoms of pericarditis or endocarditis exist: the only indication the practitioner has to fulfil in such a case, is to subdue the inflammation. Let us now take another view of the matter, and suppose that inflammation has given rise to certain inflammatory products, which have become deposited on the surface of the valves; in such a case the first object will be to subdue the inflammation, if it still exist; should he find his efforts unavailing for the accomplishment of this, he must, in the next place, turn his attention to the removal of the secondary effects of the disease, to remedy in fact the disturbance which may have supervened in the circulation from the depositions of the morbid product, which subsequently proves a mechanical obstacle.

This mode of viewing the indications to be fulfilled in the treatment of cardiac diseases, contains in it nothing new; there is in fact a striking analogy between such method and the indications to be fulfilled in treating common fever. In the latter disease, the great object of the practitioner is, first, to attend to the constitutional disorder, and, afterwards, to relieve, or, more properly speaking, to obviate and anticipate any local affections or determinations which may result from the primary disturbance. Does not this view of the matter shew how truly simple the pathology of disease is, when considered, as it should be, apart from preconceived notions, and vague and speculative theories?

In describing the treatment of diseases of the heart, I shall present it according to the nature of the disease in question; and shall commence with the inflammatory affections of this organ. In treating its acute inflammations I always, of course, adopt the antiphlogistic method; such as bleeding, general and local. The object of this is twofold—1st, to subdue inflammatory action; and 2nd, for the purpose of diminishing the quantity of blood in the system, and thereby lessening the labour of the diseased organ. After this, the use of calomel, or blue pill with opium should be adopted; the same indications are fulfilled here as in other inflammatory affections: 1st, by these means we prevent or stop the effusion of coagulable lymph: 2nd, we likewise promote the absorption of any which may have been already thrown out, in this way interfere with its organization, and thereby arrest adhesion, which, in such an organ as the heart, must evidently be attended with serious inconvenience in respect to the action of this important viscus; 3rd, the employment of decided vascular depletion, together with the exhibition of mercurials, will have the effect of preventing the disease from taking on the chronic form. I must here add that if the affection of the heart be of a metastatic or rheumatic origin, the addition of colchicum and Dover's powder will be found very serviceable.

In treating these cardiac affections which have been considered *nervous*, and which are characterised by excess or irregularity of action, the best mode of treatment is the use of the different preparations of iron. This is a state of the system where the employment of the citrate of iron, as also the ammonio-chloride of the same metal—may be prescribed with great advantage. Anodynes, or more properly, the various sedatives — the judicious combination of aperients and tonics — such nutritious diet as will agree with the stomach, and be easy of digestion—and gentle exercise in the open air,—are all to be recommended.

Where the disease of the heart has now become chronic, and has taken deep root, a decided cure can no longer be expected; our treatment, unfortunately, must henceforward be purely palliative; our aim must be to prevent the extension of the disease, the removal of which is no longer within our reach. This is to be effected by gentle measures cautiously employed; such as small local bleedings, and the rigid observance of dietetic rules.

We shall now take into consideration the complex or secondary lesions, almost necessarily resulting from primary disease of the heart. Among these secondary affections we may consider serous congestions, pneumonia, bronchitis, dyspnœa, asphyxia, &c. The treatment here differs somewhat from that applicable to them when idiopathic, or not complicated. For example, the bronchitis consecutive to sanguineous congestion occasioned by hypertrophy or narrowing, will be relieved by means which would fail in simple bronchitis; we should now employ digitalis, with blood-letting to relieve the congested state of the lung and of the bronchial mucous membrane. The dyspnœa, which then supervenes, will be relieved by the same means, which would aggravate matters were the dyspnœa merely nervous. In many cases œdema, and effusion into the serous cavities will be diminished by the same operation, which, by unloading the vascular system, promotes the absorption of the effused fluid.

When cerebral symptoms are complained of, the local abstraction of blood from the vessels of the neck will afford relief. We have said that in cases of dropsical effusions blood-letting may be beneficial; such practice, however, may be contra-indicated; if so, the employment of stimulants and active diuretics is called for, such as squill, &c.; hydragogue purgatives also, as jalap, gamboge, and elaterium; the effects of the latter medicine, however, must be carefully watched, from its known tendency to produce a feeling of exhaustion in broken-down constitutions. Where the cardiac disease has followed gout or rheumatism, blisters or rubefacients may be applied with advantage to the extremities; or probably better to the primary seat of these affections. In the case of narrowings and ossifications of the orifices of the heart, the physician will be guided by circumstances in employing depletion. Once more, however, I must impress on the mind of the practitioner the risk of employing depletive measures in organic diseases of the heart. Where hypertrophy exists, for instance, the heart requires considerable strength to overcome the obstacle which originally caused it. In conclusion, in all organic diseases of the heart, strict attention to quietude, both physical and moral—a due regulation of the digestive functions—and great care in promoting the several secretions and excretions of the body are of paramount importance.

SPECIAL DISEASES OF THE HEART.

Having thus given a view of the diseases of the heart in general, a summary of the symptoms accompanying them, and the causes which lead to their development, I now come to consider these affections more specially and in a separate form. The importance of this organ to the health and well being of the individual will be considered, I trust, a sufficient apology for this minuteness.

Pericarditis.—By this disease is understood inflammation affecting both the serous membrane which covers the heart, and also the sero-fibrous sac which encloses that organ.

Anatomical Changes.—These are similar to those which occur in inflammation of all such membranes: namely, red colouring, apparent thickening, and sometimes loss of transparency of the membrane. The red colouring is in general but faintly marked in the acute stage of the disease. It depends on injection of the capillaries, and is seated in the sub-serous cellular tissue rather than in the membrane itself. It assumes a variety of forms, being sometimes mottled, whilst in other cases it presents itself in scarlet patches arborescent, or otherwise; these may ordinarily be ascribed to hæmorrhage, or to mere cadaveric imbibition entirely unconnected with any inflammatory process. The red colourings are in general more apparent at the root of the great vessels, where the serous membrane is reflected, and where of course there is a greater quantity of sub-serous cellular tissue. In some cases there is scarcely any perceptible redness of the inner surface of the serous membrane. We must beware of taking for a thickened pericardium the false membranes which are intimately united to it, and form a sort of lining for its inner surface. With respect to the morbid products exhaled by the inflamed pericardium, they may be referred to two principal varieties; sometimes the liquid effused differs but little in any respect from ordinary serum, whilst at other times, and this is the more frequent occurrence, it is entirely different in its composition. These two products correspond with two different modifications of the inflammatory process; the first consists in the temporary cessation of the ordinary exhalations of the inflamed membrane, which is dry, sticky, less soft to the touch, and without its normal smoothness. This dryness marking the onset of pericarditis is more uncommon than the effusion of serum. The same thing occurs in inflammation of other membranes which have in consequence been called dry; in this early stage the membrane is not so easily separated from the heart as at a later stage of the disease. The serous fluid exhaled in pericarditis is deserving particular attention; sometimes it differs little from common serum, at least in its physical properties; it is limpid, somewhat greenish or slightly fawn-coloured, whilst at other times it contains three new principles; namely, coagulable lymph, globules of pus, and the colouring matter of the blood: the last-mentioned educt was discovered by Louis only in five out of thirty-seven cases. The quantity of the serum found, more especially if the patient be carried off in the early stage, varies from half-a-pint to three or four pints; in some cases the small flocculi are seen floating in the serum and scarcely interfere with its transparency; the contrary takes place when these flocculi are larger, or greater in amount. Soft and transparent false membranes also are observed on the heart; these are deposited on, rather than adherent to, the pericardium. As the inflammatory orgasm diminishes, absorption becomes more active, and a considerable portion of the serum is thereby removed, so that the fibrine now predominates; this becoming organized gives rise to the production of false membranes, which are deposited partly on the visceral layer of the serous membrane, and in part also, but much more sparingly, on the parietal; and here we may remark, in connexion with the latter fact, that inflammatory action affecting the pleura or lung, is not so readily transmissible from these organs to the substance of the heart, as from the latter to the former; which perhaps may be explained by the less tendency to inflammatory action in the parietal than visceral portion of the pericardium. May not the higher state of organization of the heart also have some share in producing this effect? Sometimes, though seldom, the inflammation is limited to a very small portion of the serous membrane; the relative frequency of partial to general pericarditis being, according to Laennec, as about one to ten. It occasionally happens, that the false membranes are deposited on the auricles, and that part of the pericardium reflected around the great vessels, or else on the heart, to the exclusion of the pericardium. The colour of the concretion is yellowish or greenish, when the serum is transparent, or nearly so; if pus or blood be effused into the pericardium, the concretions are of a whitish-green or reddish colour.

The presence in the pericardium of a fluid consisting of serum, in which globules of pus float, has been observed by Corvisart, Andral and Louis, as also by myself. Sometimes, as Laennec states, pericarditis, like pleuritis, is hæmorrhagic, and then the serum is bloody, and the false membranes present a more or less florid red colour. It sometimes, but rarely occurs, that a large quantity,—even several pints, of a sanguinolent secretion devoid of coagula,—is found in the pericardium; in such instances also a pseudomembranous layer of a reticulated appearance is observed to surround the heart and to line the inside of the pericardium. When the quantity of the sanguineous fluid is considerable, the heart is found to be compressed and diminished in size. Effusion of the same kind also takes place into the pleura. The occurrence of this rare variety of pericarditis depends on a resolved condition of the blood, such as exists in scurvy and purpura hæmorrhagica.

The quantity of fibrinous lymph thrown out in pericarditis varies much. Sometimes it is sufficient to cover the entire pericardium, occasionally it is much less extensive. The forms it assumes are different, depending, no doubt, on the varying degrees of intensity of the inflammation in different points. At times it is entirely amorphous, but generally it puts on the appearance of a membrane; the free surface is granulated, somewhat like a honey-comb in the former case, and in the latter bearing a resemblance to butter or thick grease pressed between two marble slabs. Often the surface of this lymph presents a great number of flocculi, owing probably to the alteration of the secretion, which now becoming serous, serves to loosen and detach from the inflamed surface portions of the fibrinous exudation previously formed.

When this fibrine has been for some time secreted, the surface of the membrane becomes wrinkled or undulating, in consequence, no doubt, of the incessant dilatations and contractions of the heart. The more rough or granulated the surface of the false membrane is, the more closely allied is the case to metastatic or rheumatic pericarditis. It would be a gratuitous assumption to suppose that an effusion of lymph necessarily occurs in all cases of metastasis to the central organ of the circulation, any more than in all cases of rheumatism of the joints.

When the effused lymph is not absorbed at an early stage, adhesions will ensue between the opposed surfaces, by which means the further progress of the morbid effusion, and probably of the disease itself, may be arrested. It too often happens, however, that the adhesions so formed, when organized, become condensed and shrunken, and the consequence will eventually be, that the movements of the heart will be restricted and impeded, and at length various abnormal changes will take place in the structure of this organ.

It is a question not unworthy the notice of the pathologist, whether in case of inflammation of the pericardium, the visceral or parietal layer of the serous membrane becomes first attacked? Would it be going too far to say, that in case of cold the external or parietal layer is the one first affected, whilst in metastatic pericarditis the visceral is the one earlier inflamed. Can we derive any aid from analogy in this enquiry? In inflammation occurring in the anterior chamber of the eye, we find the pupillary margin of the iris almost invariably the seat of inflammation, rather than that lining the posterior surface of the cornea. Can this be accounted for by the comparatively inferior degree of organization of the cornea? That is, it may be that the degree of organization of the structure with which the serous membrane may be in contact, exercises some influence. In a practical point of view it matters very little how this question is decided; as every body must know that the lymph thrown out on either of the opposed surfaces, will forthwith act as an irritant on the other, and so occasion active inflammation in it.

In chronic pericarditis the redness is less intense than in the acute form. The energy of the heart's beats is considerably impaired by the pressure of the effused fluid, and the organ itself undergoes various changes presently to be noticed. Thickening may also occur in the pericardium, as a consequence of chronic inflammation; this is most apparent in the subjacent cellular tissue; it may sometimes be referred to a dense false membrane closely adhering to the pericardium. These cellular adhesions are sometimes thick and fibrous, sometimes cartilaginous and bony. Occasionally sero-puriform matter is found in the pericardium, and still more frequently we discover serum in various states of clearness and opacity, and sometimes mixed with blood.

Should pericarditis not terminate in resolution and absorption of the fluids effused, we have to look for adhesion of the opposed surfaces, by which means further effusion, as we have said, is arrested. The occurrence or non-occurrence of adhesion, will depend mainly on the quality of the effusion; if this consist of a large quantity of serous fluid, adhesion is prevented. The substance of the heart after pericarditis may be in its normal state, or may become redder or paler than natural, yellowish, or brown; its consistence also may be changed; it may undergo induration or softening. It may be well to remark, that a great number of the cases of diseased heart, whether of the substance of the organ, or of its valves, may be ultimately referred to some previous inflammation of the pericardium.

Complications.—Rheumatism appears to be the most frequent of these. When pleurisy and pneumonia co-exist with pericarditis, there is reason to believe, as I have already mentioned, that it is almost invariably an extension of the cardiac affection to the lung and pleura; though the contrary opinion has been maintained. Bouillaud states that there are few instances in which the disease is free from complication; for out of forty-six, he ascertained that five only presented the affection in the simple or unmixed form. According to the same authority, one half of the rheumatic patients labour under either pericarditis or endocarditis. This I have no doubt is an exaggeration. It has long been my opinion that in most of the instances of translated rheumatism to the lining membrane of the heart, this organ itself is already pre-disposed by the previous action of some debilitating cause, or by a peculiar nervous mobility in the patient.

Age.—Pericarditis rarely attacks children under the age of six years, or before the time when the permanent teeth begin to appear. After this period, however, up to puberty, there seems to be a greater disposition to a metastasis of rheumatism to the covering of the heart: this is more frequently the case when the synovial and ligamentous structures of the joints are the seat of the rheumatism. M. Bouillaud considers that individuals between their tenth and thirtieth years are most liable to this disease; whilst M. Louis has remarked the period between twenty and thirty, and between sixty and seventy, as presenting the most numerous instances of it. It has been stated by the latter, that the proportion of males to females attacked with this disease is as three to one. This is by no means conformable to my own experience. I have seen females at the age of thirteen or fourteen, or some time before the period when the catamenial flux is expected, presenting all the symptoms of pericardial inflammation.

Symptoms.—Fever rarely ushered in by shivering; pain in the region of the heart, more or less acute, lancinating, aggravated by a full inspiration, as well as by coughing, or change of position. Sometimes the seat of this pain is the lower extremity of the sternum, shooting at times backwards to the left shoulder-blade, upwards towards the left collar-bone, and running thence down the arm nearly as far as the elbow. The suffering is much increased by strong pressure in the direction of the epigastrium, or left false ribs; pressure over the heart between the cartilages and ribs will have the same effect. The difficulty of detecting pericarditis is augmented by its being occasionally complicated with pleuritis or pneumonia, or other diseases of the chest which mask its symptoms. In cases where the pains of rheumatism in the joints are very acute, the cardiac disease is frequently overlooked. Notwithstanding the great stress laid on the presence of pain as a characteristic of this affection, my own experience leads me to say that in very many instances this symptom is but little complained of.

The respirations are observed to vary from 30 to 40, or even more, in the minute;—breathing difficult and anxious, and accompanied with frequent sighing; oftentimes it can be performed only in the erect posture. This dyspnœa, which comes on in paroxysms, is oftentimes induced by some cause unconnected with the disease, such as mental emotion, or some bodily movement. This symptom, as being common to all thoracic affections, is of no diagnostic import in the disease now under consideration. When the diaphragm happens to be implicated, hiccup supervenes, and sometimes vomiting. Among the early symptoms are oppression, and a feeling of great anxiety or distress. Palpitation and great throbbing of the arteries of the neck; the pulse very frequent, seldom below 120: it is full and strong at first, but after the disease has lasted three or four days, it becomes small, hard and irregular: there is a tendency to swoonings also, when the patient attempts to walk across the room, or turn in the bed. Cough is sometimes present, especially if the disease be complicated with pleurisy or pneumonia. Pigeaux accounts for it by referring it to sympathetic irritation of the pneumo-gastric nerve: a very striking symptom, but one not noticed by writers, is the patient frequently applying his hand to the region of the heart. After a time swelling of the lower extremities manifests itself, the countenance assumes a ghastly, somewhat bluish cast, with some degree of puffiness, more especially under the lower eyelids, and an expression of anxiety and indescribable terror; the muscles of the face become convulsed, and in some cases there is even the risus sardonicus; a constant desire to obtain fresh air, and jactitations are frequently observed; the eyes, which in the early stage were prominent and injected, are now haggard, and expressive of the utmost distress. Amidst the most imminent asphyxia, in which the intellect oftentimes remains unimpaired, the unhappy sufferer wishes for death. Mirabeau, it is said, when labouring under this complaint, implored his physician Cabanis to terminate his intense agony by a poisonous dose of opium. A prominent symptom in this disease is extreme watchfulness. Should the patient fall into a momentary slumber, he at times starts up suddenly in the greatest terror; at other times, amid his watchfulness, delirium comes on, accompanied by spasmodic movements, or general convulsions. Vomiting is another symptom occasionally experienced in pericarditis. When the latter affection is complicated with diaphragmatic pleuritis, the vomiting is sympathetic, and may be accounted for by the vicinity of the diaphragmatic pleura and peritoneum, as well as by the reaction of the diaphragmatic nervous system on the nerves of the stomach (8th pair). To M. Bouillaud we are indebted for this symptom and its rationale.

Physical Signs.—These are to be ascertained by inspection, palpation, percussion, and auscultation.

Inspection.—A prominence in the præcordial region is perceivable, more especially in children, whose cartilages are so very pliant and flexible. In the adult this prominence is most limited, being confined to two or three of the inferior cartilages, and more to the left than in the case of the child. Louis makes the remark, that a fulness of the cardiac region may be occasioned by a temporary effusion of fluid. This projection may be accounted for by the increased impulse of the heart, or according to others, by effusion into the pericardium; the augmented impulse is very manifest, even on mere inspection. There is in fact no affection of the heart in which such extended and manifest pulsation is observed over the whole anterior surface of the chest as in pericarditis. Every portion of it in a word appears to be in motion. By sight also we obtain a sign erroneously supposed to be characteristic of adhesion of the pericardium to the heart ; this is a hollow in the upper and left part of the epigastrium, directly under the left false ribs, and observable during each contraction of the heart. A sort of wave also passing on from a little below the left nipple, proceeding obliquely downwards toward the epigastric region, cannot fail to strike the eye of the attentive observer. This sign of pericardial disease derived from actual observation, I deem well worth recording.

Palpation.—By the sense of touch we discover the pulsations of the heart much stronger, as well as more frequent than natural ; sometimes they are uniform, at other times they are found to be irregular and tumultuous. In this case the strong impulse of the heart is plainly felt with the hand. We have just said that the same sign is obtained by inspection. After considerable effusion, however, has taken place into the pericardium, this strength of impulse as well as the palpitations ordinarily attendant on it, are no longer perceptible. The friction sound, of which more presently, is also discoverable by the touch.

Percussion.—After the disease has existed for some time, a dull sound is obtained by percussion over the region of the heart; the degree of the effusion will be indicated by the extent of this dulness. Should this effusion be small in quantity, the site of this dull sound, as well as the extent over which it is heard, will be influenced by the position which the patient assumes whilst being examined. When we entertain a doubt on the subject, and we wish to ascertain whether there is an effusion in the pericardium, we should place the patient in a sitting, or if his strength allow it, in a standing posture, since when he lies down, the fluid will necessarily gravitate to the depending part.

Auscultation.—The signs derived from the sense of hearing in pericarditis, are capable of being arranged under three heads; viz. the *friction* or *rubbing sound;* this is audible more especially in the acute stage, and accompanies both sounds of the heart. In this disease the quality, *i.e.* the degree of humidity or dryness of the friction sound will vary with the humidity of the rubbing surfaces; this holds good, however, only when the false membrane is soft and humid; for if it have become very firm, the friction sound is still a dry one. The latter sound is comparatively superficial and very near the ear. It is sometimes modified, and bears a strong resemblance to the *creaking of new leather*, hence the term *leather-creak*, as first given to it by M. Collin. This is particularly observable when the discase is becoming chronic; it is indicative of induration of the membranes, the product of inflammation.

The last of the abnormal sounds characteristic of pericarditis is the *bellows' sound*, which in this case is but single; it is connected with internal inflammation of the heart, and no doubt in some few cases with dilatation of the ventricles of this organ; it generally accompanies their systole.

Treatment.—This must be of a decidedly antiphlogistic character. On the first two or three days venesection must be employed to some extent, each bleeding to be followed, after the lapse of a little time, by the application of leeches, the number being proportioned to the age and strength of the patient as well as to the severity of the inflammation. It has been observed, that general blood-letting can be tolerated better, and will be found more beneficial, in this than in any other form of cardiac disease. When the affection complicates rheumatism, very little aid can be derived from the appearance of the blood with respect to ascertaining the necessity or expediency of continuing the depletion further, as during the presence of rheumatic inflammation in the system, the blood drawn will generally present the buffy coat, no matter how far the depletion has been carried; and independently of any rheumatic complication there is not much reliance to be placed on the appearance of the blood where the heart is affected. It may be laid down as a safe guide in practice, that should the intensity of the symptoms not be abated by the early bleedings, and no perceptible improvement take place in the condition of the patient, the further abstraction of blood must still be persisted in, until a marked impression be made on the disease. The quantity of blood to be taken in the subsequent bleeding will be regulated by the manner in which the patient seemed to bear the operation in the first instance.

The local bleeding will be found to assist considerably in abating the pain, and in relieving the feeling of anxiety and oppression, which I have stated to be so very characteristic of this affection and so distressing to the patient. I would not be understood, however, to advocate the large abstractions of the vital fluid inculcated by M. Bouillaud in his valuable work on Diseases of the Heart. There are serious risks attached to such copious depletions, which I shall notice more particularly when on the subject of endocarditis. It has been stated, and perhaps with some correctness, that when adhesion has once taken place, as may be suspected if the friction or rubbing sound be present, the same curative results cannot be obtained from blood-letting, as before the occurrence of such an event.

There is another opinion entertained by some members of the profession regarding the results of adhesion; it is this: that when adhesion of the pericardium has once taken place, the life of the patient is inevitably shortened. An extended experience in diseases of the heart obliges me to give but a qualified assent to the truth of this statement. I have known persons going about and attending to their ordinary concerns, presenting all the signs of pericardial adhesion. I may further refer in refutation of such an opinion to autopsic examinations I have made of persons, in whom I detected adhesions of the pericardium though these individuals during a long life had never complained of any particular distress in reference to the heart.

If the patient be very young, the application of leeches in many instances will suffice instead of venesection.

Besides blood-letting, which is to be carried as far as the strength of the patient will admit, and the intensity of the symptoms seems to require, we must also have recourse to other therapeutic means. Tartar emetic may be administered with advantage; the most effectual remedy, however, is mercury, which, in combination with opium, has been found highly serviceable, as I have already stated, in preventing adhesion, in arresting the continuance of this process when it has already commenced, and in promoting the absorption of any existing effusion. The use of the mercury must be continued till the gums are affected by it, and then its employment must be given up gradually; as it has been observed that its sudden or abrupt cessation has been followed in many instances by return of the inflammation, or a suspension of the absorption of the effusion. Digitalis, either by itself, or combined with other sedatives, as hyoscyamus, will be found useful, from its well known power of moderating the heart's action, and of thus placing it in a condition of comparative repose. Other medicines of the same class, as prussic acid, camphor, etc., are employed for the purpose of producing the same effect. Where the strength of the patient becomes prostrated, diffusible stimulants will be found necessary. On such occasions Frank was in the habit of employing musk. When the violence of the inflammatory symptoms has been subdued, the use of gentle laxatives will be found advantageous, as well as diluent drinks. Should the antiphlogistic treatment already recommended not succeed in preventing effusion, the application of a large blister to the precordial region will tend to promote absorption. As spasmodic symptoms sometimes accompany pericarditis, opium is employed for its antispasmodic powers: some caution, however, is required, as this medicine sometimes interferes with the pulmonary and cardiac circulation, and hence aggravates the dyspnœa and distress already present.

The same strict attention to diet and regimen must be enjoined here, as in the inflammation of all vital organs.

Chronic Pericarditis.

It is the almost universal opinion among the medical men who have written on the subject of Pericarditis, that the chronic form of this affection is always a consequence of the acute. Though in the great majority of cases this may be correct, my own experience warrants me in thinking that there are cases of chronic pericarditis not at all preceded by an obvious acute stage. The little or no fever present, and the mitigated character of the local symptoms, will frequently cause the incipient aggression of this disease to remain for some time unnoticed, particularly if primarily chronic. This latency of the affection, however, arises less from sufficiently marked signs, than from want of attention on the part of the practitioner.

Signs and Symptoms.—These will vary considerably according as the disease is accompanied by effusion or adhesion.

The signs of effusion we have already seen to be as follows: the arching or bulging of the præcordial region—the absence, or at least remoteness of the heart's sounds, as well as the very great obscurity of the pulsations of this organ—and also the dull sound elicited on percussion. Now, though it is very probable, that where such signs coexist in any given case, the presence of hydropericardium may be inferred with a considerable degree of certainty, all doubt will be removed if to the above signs there be added the symptoms of a sense of distress, or of a dull pain in the cardiac region, slight fever, and dropsical appearances in the face and lower extremities. In case however, no hydropericardium existed, but the chronic inflammation gave rise to the formation of false membranes, and consequent adhesion, then other signs will be afforded, which will be modified by the nature of these membranes. If their surface is rough, we shall have the friction or rubbing sound already mentioned under acute pericarditis, and this also will be comparatively close to the ear. Should the products of the inflammation be of a cartilaginous or bony consistence, this friction sound will be more of a rasping character. M. Bertin has made a remark, which must be received with some limitation, that when the disease has terminated in adhesion, or in the formation of a false membrane of a cartilaginous or bony character, there will not necessarily be produced any disturbance of the functions, in which case the diagnosis will be very difficult. The symptoms indicative of a disturbed state of the respiration and circulation, such as dyspnœa, character of the pulse, etc., will be sometimes present. Before we can form a diagnosis, however, based on the latter symptoms, we must satisfy ourselves with respect to the state of the lungs; and must make close examination, so as to ascertain whether the substance of the heart, or even its valves, may not be the real seat of the affection. Some of the continental pathologists have been at considerable pains in order to ascertain the signs and symptoms characteristic of pericardial adhesion. Lancisi, in particular, has set down palpitation, irregularity, and smallness of the pulse, a tendency to syncope, dyspnœa, a feeling of great oppression, and coldness of the extremities, as the most constant and certain diagnostics of this pathological state. Among the symptoms of it Burns places pulsations on the left part of the chest and epigastrium, whilst Professor Kreyssig, who has studied and written on diseases of the heart with distinguished success, considers strong pulsations of the heart and aorta as one of its most constant and important concomitants.

A symptom mentioned by Dr. Sanders, and one to which he assigns great value as a decided character of adhesion of the pericardium, is a constant wavy or undulating motion, which is observable somewhat lower down than the region of the heart; and such movement he accounts for in the following ingenious way: he says, that whilst both ventricles contract simultaneously, the apex of the heart is tilted forwards, by which the lower portion of the diaphragm is also carried upwards; there is then formed a sort of dimple under the false ribs of the superior region of the abdomen, whilst on the dilatation of the ventricles, the apex of the heart, together with the diaphragm, descends, causing a fulness or prominence in the part where the depression previously existed. This undulatory movement in the epigastrium has not been noticed by other observers. The germ of the idea seems to have been borrowed from Professor Heim of Berlin. Under the head of acute pericarditis, I have alluded to a somewhat similar phenomenon.

Another sign frequently accompanying chronic adhesion of the pericardium, and one which I find mentioned by no other writer, is, a simultaneous prominence and depression between the fifth and sixth, the sixth and seventh ribs. At the same time, there is a remarkable pulsation observable perpendicularly upwards along either side of the sternum: can this depend, in any way, on the effect of the adhesion of the mediastinum? Another circumstance which I have also seen in this affection, is an obvious and simultaneous pulsation, both in the epigastrium and at a considerable distance upwards and to the left side. A few moments before penning these lines, I examined a patient with pericardial adhesion, who had presented all these signs in a very striking manner. Though the man was but small in size, the distance alluded to was a little more than five inches. I should not forget to notice another remarkable phenomenon observed in this affection; viz., a strong manifest pulsation all over the vessels of the neck, as well as in the subclavians, together with a marked hypertrophy in the sterno-cleidomastoid muscles. The latter sign clearly depends on the more or less habitual difficulty of breathing, occasioned by the morbid state of the heart. The above signs appear to be the more manifest in proportion to the chronicity of the disease, and the youth of the patient.

When on the subject of acute pericarditis, I noticed somewhat in detail the *anatomical characters* of that affection; so that not much remains to be said on that point in reference to the chronic variety.

Anatomical characters.—There is but little to be added here to what has been already said when on the subject of the acute form. The lesions connected with chronic pericarditis are, opaque spots and formations closely resembling cartilage or bone, effusion of serum or pus, adhesions, partial or general, and false membranes. The pericardium sometimes presents a thickened appearance; the seat of this thickening is in the subjacent cellular tissue beneath the serous membrane, and in the fibrous membrane according to Bouillaud, or sometimes on the surface of a false membrane, closely adhering to the serous layer. In the earlier stages of the chronic form of the disease, the capillaries, and even larger vessels near to the pericardium, are observed to be turgid, and much enlarged. It has been laid down, that the effusion of serum and pus, mixed in variable proportions, is the most frequent lesion attendant on chronic inflammation. This statement is, in my opinion, too sweeping, and far too general. Fibrinous bands, connecting the parietal to the visceral layer, are a common result of plastic lymph effused into the pericardium. These, after some time, become elongated and attenuated, and at length disappear. Sometimes these bands are short, broad, and constant, and form a complete adhesion of the heart to the pericardium. On the whitish spots so commonly seen on the heart, and more especially on the surface of the right ventricle, cartilage or bone is sometimes deposited. When the heart adheres, whether by its apex or one of its surfaces, such adhesion is effected either by means of false membranes, or (the latter becoming organized,) by the medium of fine cellular tissue. Corvisart describes several species of these connecting bands. He considers them as the result of rheumatic and gouty disease. The cartilaginous and bony patches produced within the pericardium assume a variety of forms, presenting rounded or triangular edges: the tissue from which they are formed varies. Occasionally they form between the serous and fibrous coat, in which case they are external to the serous membrane, and have their seat in the cellular tissue, connecting it with other surrounding parts: more frequently they take their origin in the false membranes investing the heart. When these products are seated beneath the visceral layer, they are observed to dip into the substance of the heart.

Treatment.—When commencing the treatment of chronic pericarditis, in which of course we are to be directed, more or less, by the symptoms, it is of the utmost importance carefully to distinguish those connected with the organic lesion from those which are purely sympathetic and consist chiefly in functional disturbances: though the removal or alleviation of the latter can have no tendency to remove or affect the primary cause of the disease, which may now have gone beyond the reach of art, still it is incumbent on the practitioner to combat them by every means in his power. Another point necessary to be kept in view in treating this affection, is to employ such a course of therapeutics as may be applicable to the cure or palliation of the original or primary disease, of which the pericardial complaint is only an effect, or, at least, a complication. Unless when there is any appearance of an acute form being superinduced on the chronic, venesection is scarcely necessary. The application of leeches, however, both to the windpipe and beneath the left nipple, will be advisable. Such application should be repeated when there is a return or increase of the local pain. The leeches placed on the neck will have the effect of removing spasm of the trachea, which would interfere with the freedom of respiration; by removing such spasm, the enlargement of the lungs, arising from the imprisonment of air, is obviated, and thus more space is left for the free action of the heart. The same principle should be kept in view in the treatment of all diseases of the heart. The moderate exhibition of mercury will prove beneficial for the purpose of promoting the absorption of any morbid effusion into, or thickening of, the pericardial membrane. Tartar emetic, with nitre, will also be found useful for its anti-phlogistic and indirectly diuretic powers. The more direct diuretics also, as the infusion of digitalis, squill, acetate and hydriodate of potash, spirit of nitric æther, &c., may be prescribed. As in all diseases in which the promotion of absorption is an object, purgatives should be employed. Keeping the digestive organs in proper order, and preventing the accumulation either of flatus or solid contents, will have the effect of obviating encroachment on the thoracic cavity, and more especially on the heart.

Counter-irritants, of various kinds, may be had recourse to with much benefit.

It is hardly necessary to inculcate the absolute necessity of strict attention to regimen.

ENDOCARDITIS.

The disease I now purpose to describe, namely, inflammation of the internal or lining membrane of the heart, was not known at all to the older pathologists. Corvisart, so far from being aware of the existence of this affection, does not allude even in the remotest degree to inflammation either of the portion of this membrane lining the chambers of this organ, or of that covering its valves. Though some modern physicians seem disposed to give both Baillie and Burns the credit of having been acquainted with the disease, and to the former chiefly from his having made some scanty references to certain abnormal appearances on the valves, I feel convinced that to Bouilland is justly due the great merit of having established the regular claim of this important disease to a place in the nosological cadre, and for having given it its present name;—an appellation, by-the-by, the correctness and appropriateness of which is now universally recognized. Laennec, though he admitted the existence of this affection, considered it of very rare occurrence. The reasons assigned by this great authority for insisting on its infrequency appear to me to be anything but conclusive.

The ardour with which this disease has been studied of late years may be accounted for, from the fact of its having been deemed one of the most important links in the chain of causation of the most serious organic affections to which the heart is liable. It bears some resemblance to the malady I have been last considering, in its great frequency, in the causes which produce it, and in the very serious results to which it may give rise. Bouillaud has divided it into three distinct stages, each characterized by peculiar and distinct lesions. In the *first* or early stage the following are the lesions observed:—sanguineous congestion, the redness varying from a scarlet colour to a reddish-brown. With respect to this phenomenon, there is some question about its value, as it may be the result of cadaveric imbibition. Such redness, however, will be the effect of inflammation, if it be accompanied by thickening of the parts, which have become reddened, as well as by the other products of inflammation, as pus, false membrane, colourless clots, &c. This redness is most marked on the valves and near the orifices. The other characters indicating this early stage of endocarditis are thickening and softening of the membrane, as also the deposition or secretion of coagulable lymph or pus. This thickening is also greatest on the valves. In the *second* stage the fibrinous concretions and other products of the inflammation become organized, and form vegetations and granulations; the latter occur most frequently on the free edges of the valves. It is in this period also that valvular adhesions, accompanied or not by narrowing of the orifices, ordinarily take place. The *third* stage is denoted by the morbid products above mentioned becoming converted into cartilage, bone, and calcareous matter, and thus giving rise to induration of the valves and endocardium. Those persons only will allow the correctness of the above division, who admit that the characters of the third stage are necessarily the results of inflammatory action. The thickening of the endocardium is not very readily verified, owing to the secretion being partly carried away by the current of the blood: it is most perceptible on the surface of the valves. The thickening is considered to be sometimes occasioned by the deposition of albuminous matter secreted at the surface. In whatever way, however, the thickening is produced, it may be looked on as one of the most constant phenomena of inflammation of the endocardium. The concrete matter, when effused, often attaches itself to the surface of the valves, and is also frequently entangled in the meshes of the carneæ columnæ. There is every reason for supposing these concretions to be formed within the heart; the same thing has been known to occur within inflamed arteries. This plastic lymph also it is which has been found to effect adhesions of the valves to the auricles and ventricles; it also sometimes concretes into small masses.

Laennec, who did not fail to observe them, but could see no relation whatever between them and inflammatory action, gave them the name of globular or warty vegetations: he considered them to be produced by some disturbance in the circulation. This idea of Laennec favours in some degree the opinion first stated, I think, by Kreyssig, that the blood was rendered coagulable by passing through the lining membrane when inflamed.

The globular vegetations above mentioned are of a soft consistence, sometimes of a whitish or yellowish colour, and sometimes somewhat red; they are very easily detached. The warty excrescences, on the contrary, are hard or tough like cartilage, and adhere very firmly. The coagulable lymph thrown out in the first stage becomes in the second organised, so as to give rise to the presence of false membranes, which are seen on the endocardium, and impart to that structure the appearance of being thickened. This inner membrane also is found to undergo a real thickening; the valves too become thickened or hypertrophied, as well as the membrane surrounding the orifices; this will, of course, tend to narrow them. Another morbid change observed in this stage is adhesion of the opposite surfaces, as also of the valves to the corresponding wall. The former variety of adhesion is, however, more or less prevented by the force of the circulation. M. Bouillaud adduces several cases of such phenomenon. Adhesion has sometimes been observed between the opposed margins of the valves; this is more frequent where the corresponding orifice has become contracted.

At a more advanced, or what may be considered the *third* period, the morbid formations of the preceding stage put on a cartilaginous, osseous, or calcareous consistence, or we may have calcareous matter, pus, and coagulated blood, infiltrated beneath the membrane, mixed together in various proportions. The valves and orifices now become indurated, by which the motions of the former are impeded, and the normal width of the latter is diminished. The bases and free edges of the valves are the more ordinary seats of these cartilaginous and osseous formations. These depositions sometimes take place in the form of defined points, and occasionally in that of patches, whilst at other times an entire valve undergoes this morbid alteration; the ring surrounding an orifice sometimes becomes the seat of this conversion into cartilage, bone, or calcareous substance, and its diameter becomes diminished. The calcareous formation in such instances may be so considerable in quantity, as to enter deeply into the muscular substance of the heart. As long as the calcareous depositions on the valves are but small and circumscribed, the normal motions of these parts are scarcely ever impaired; but when these depositions become somewhat extensive, thereby producing in the valve a certain degree of rigidity, it then is rendered inadequate duly to discharge its functions. Pathologists have observed that these morbid alterations occur much more frequently on the left than on the right side of the heart: this might be almost inferred *à priori*, from the greater degree of action imposed on the former than on the latter, by which it is rendered more liable to disease. A peculiar change is sometimes produced in the form of those valves which have become the seat of these morbid depositions; their margins at times become *inverted*, sometimes *everted*, or rather *retroverted*. Various other changes affecting their size are incidental to the diseased valves, whereby they are rendered incapable of completely closing their corresponding orifice. As the valves, so also the orifices undergo abnormal alterations in consequence of these cartilaginous, osseous, and calcareous conversions. Nor is it to be supposed that these accidental alterations are peculiar to old age. With respect to their origin, there is a diversity of opinion among pathologists. M. Bouillaud will have it that these morbid products are but the results of inflammation, the mere germs, as it were, which, by their evolution, assume a variety of forms. Others account for these cartilaginous and osseous formations differently; they say that the presence of sanguineous congestion or hyperemic irritation is no more necessary for their formation than it is for the ossification of the cartilages of the ribs or that of the larynx in the progress of years. They account for these formations by referring them to some deviation of nutrition.

Some of the German pathologists would fain set up a close relation between ossification of the valves and gouty and gravelly affections. This, however, is mere hypothesis, which is altogether upset by the coincidence proved by M. Bouillaud to exist between endocarditis and rheumatism. Certainly, any person who will consider the nature and seat of these changes as they take place within the heart, must feel satisfied that mere deviation of nutrition can never account for their presence; there must be admitted a complete disturbance of the seat of these alterations, such as might be occasioned by chronic inflammation. In such investigation considerable aid may be derived from observing the symptoms during life.

Symptoms, &c.—As this affection is in general complicated either with rheumatism, pleuro-pneumonia, or pleuritis, it is scarcely possible to state the peculiar symptoms of it when occurring in the simple form. In the onset, there is a feeling of uneasiness or oppression, generally accompanied with præcordial distress; fever often intense. The strokes of the pulse, whilst they may correspond in frequency, do not always coincide with the pulsations of the heart in strength or in rhythm, it being well known that the action of the heart may be strong whilst the pulse is extremely small and feeble. This is attributable to the presence of some mechanical obstruction to the circulation, such as fibrinous concretions in the heart, engorgements of the valves or orifices; such states will prevent the normal column of blood from being projected into the arterial system. In the same manner we may explain the intermissions so often observed in the pulse, whilst no such character is found in the pulsations of the heart: such intermission is produced, no doubt, by the difficulty the blood experiences in making its exit from the orifices, owing to the presence of the impediments above mentioned. In this stage also the extent over which the pulsations of the heart are felt is much greater than natural; the purring tremor may also exist at this period. The extent of surface over which the dull sound is heard on percussion is also much greater than in the state of health. It is accompanied, however, with a beat of the heart, which is visible, capable of being felt, and rather close to the ear, which will serve to distinguish it from the same sign in pericarditis attended with effusion, wherein the beat is deep-seated, and scarcely sensible either to feeling or to sight.

By auscultation we may discover a bellows' sound, the loudness of which will correspond with the strength of the heart's action. This may replace either one or both of the normal sounds of the heart. During violent palpitations of the heart, a metallic sound may also be detected. The frequency of the pulse in this disease is often extreme, amounting sometimes to 150 or 160 in a minute, and becoming at the same time unequal, irregular, and intermittent.

As long as the orifices are free from obstruction, and no concretions exist on the endocardium, the venous circulation presents no appearance of embarrassment; but when exudations occur, and clots are deposited on the valves, venous congestions are observed to take place in various parts of the body; the face and hands become infiltrated with serum, and, owing to the obstruction to which the cardiac circulation is subjected, the breathing is more or less interfered with, and the patient is distressed by fits of dyspnœa closely resembling asthma. M. Bouillaud has observed loss of consciousness, convulsions, with stertorous breathing in cases where there was reason to suspect the formation of fibrinous clots within the cavities of the heart; which circumstance, by causing an impediment to the venous circulation, gave rise to cerebral congestion. It may not be amiss to state here that I have frequently found a severe fit of coughing to bring on stertorous breathing in cases of cardiac disease attended with obstructed venous circulation; this effect depended, no doubt, on the descent of the blood from the brain being interfered with by the coughing.

This difficulty and acceleration of the breathing does not always depend on the thickening of the valves, nor on the presence of concretions; it may be the result of purely nervous disturbance, or of that spasmodic state of the posterior membrane of the trachea so often alluded to.

Progress, Duration, &c.—This affection may end in perfect resolution; this will be denoted by a gradual abatement of all the morbid signs and symptoms: it may end in a few days fatally, owing to the rapid formation of false membranes. Its course is not by any means regular and uniform. The most frequent termination is from the acute to the chronic form. It is then we meet these concretions, thickening of the tissues affected, cartilaginous or bony indurations of valves and other parts, and those narrowings of orifices which are considered to characterize the chronic state of the disease. The signs and symptoms which may lead us to suspect that induration of the valves and narrowing of the orifices exist, are chiefly the bellows', rasping or sawing murmur, which has now been of some continuance with a vibratory thrill, some irregularity, inequality, and intermission in the force of the pulsations; great extent of dulness on percussion, indicating hypertrophy or dilatation; palpitations strong and frequent with disposition to syncope; small, feeble pulse, with strong action of the heart; a swollen or livid appearance of the features, serous effusions into the cellular tissue and serous cavities, and dilatation of the jugulars. The venous pulse, the name given to the last-mentioned symptom, depends immediately on the reflux of the blood from the auricle into the jugulars; it is observed to coincide with the arterial pulse, or, in other words, with the contraction of the ventricles. This depends on insufficiency of the tricuspid valve, or on increased width of the auriculo-ventricular opening.

After the practitioner has satisfied himself that endocarditis exists, he next endeavours to ascertain the precise seat of the disease; but this is frequently very difficult, and is more a matter of curiosity than of any real practical utility. The following remarks, however, may assist in this endeavour: if the disease exist in the left cavities alone, the abnormal sounds are heard beneath and external to the corresponding nipple and on the side of the chest. When the unhealthy sounds take the place of the first sound, we may refer to the aortic valves as the seat of disease, whilst the mitral valve may be referred to when the morbid sound replaces the second sound of the heart. When the right cavities are the seat of the affection, it is behind the sternum and towards its lower portion that the abnormal sounds are most distinctly marked: they accompany or take the place of the first or second normal sound, according as the semilunar or tricuspid valves are more especially affected.

Complications.—This affection very often complicates articular rheumatism, pericarditis, pleuritis, and pleuro-pneumonia. Its frequent coincidence with pericarditis may be readily accounted for by the analogy of structure. Such coincidence may be discovered when, to the symptoms and signs of endocarditis, there are superadded those characterizing pericarditis, as great dulness of the præcordial region, prominence of this part, the pulsation of the heart not distinctly felt, and its sounds removed to some distance, together with the peculiar friction sound, so constant an accompaniment of pericardial inflammation.

It has been observed that the endocardial inflammation sometimes extends to the lining membrane of the aorta, and as far as the origin of the great vessels which arise from it. When this occurs, the pulsations of the aorta are much increased in strength, as may be ascertained by placing the finger at the lower part of the neck and behind the summit of the sternum. This state may likewise be accompanied by a bruit de soufflet in the course of the vessel and along the vertebral column. This same affection frequently complicates carditis, or inflammation of the fleshy substance of the heart. It is the opinion of Bouillaud, that when inflammation of the endocardium complicates pleuro-pneumonia, the extension of the inflammatory action may be referred to contiguity of the parts.

Causes.—The predisposing causes are irregular or intemperate habits; the gouty or rheumatic diathesis, exhausting bodily toil, organic disease of the heart previously existing, more especially hypertrophy, of which the exciting causes may be considered the same as those of acute rheumatism and of pericarditis. Typhoid and eruptive fevers; sudden alternations of heat and cold, more especially after severe fatigue from long walking, running, dancing, &c.; all exercise, in fact, which is calculated to produce violent shocks on the heart, &c.; acrid ingesta; also the use of spirituous liquors in great quantity; the effects of the latter are chiefly observable on the right side of the heart, which, together with the venous system in this part, are found to have the lining membrane considerably reddened. The lung, too, is in such cases found to be congested.

Prognosis.—This will depend in a great measure on the complications present, on the period when the case was brought under treatment, and on the energy of such treatment.

There is always danger in the more acute forms of this affection, which danger is much augmented by great frequency and irregularity of the pulse, and when there is observed a tendency to syncope with cold perspirations; in the less intense forms the danger is not so imminent, unless lesions already exist, which interfere seriously with the free circulation through the heart; in the latter case the disease must eventually prove fatal.

Diagnosis.—Pericarditis is the disease which there is most risk of confounding with endocarditis, especially when the former is not attended with any effusion, but merely with the formation of false membranes. The pericardial friction, however, bears but little resemblance to the friction sound of valvular endocarditis ; it is more superficial, and is heard nearer the ear, when it depends on pericarditis. M. Bouillaud states, that he has observed the bruit de soufflet, or the rasping sound, disappear altogether when the patient changed his position, and return again on the patient resuming the reclining posture. He considers that this peculiarity indicates a pericardial friction, and not a valvular one. Some assistance might be derived from this, whenever any difficulty is experienced in the diagnosis ; further aid may also be obtained from the general symptoms. It is stated that the pain in the præcordial region, the distress, dyspnœa, the venous congestion of the jugulars, face, and extremities, are not so marked in endocarditis as in pericarditis. This latter statement, however, does not in every case coincide with my own experience.

Matters are changed, however, when the pericarditis is accompanied with effusion. The dulness is then very extensive; the pulsations of the heart, too, are in general very obscure, and scarcely sensible either to the sight or touch, whilst the contrary occurs in commencing endocarditis. Chlorosis and anemia should be distinguished from endocarditis with so much the more care, as it has been stated that the abnormal sounds of the heart must often be attributed to one or other of these two affections, and not to endocarditis. It is said, that several rheumatic patients, who had been bled largely and frequently, and were considered as labouring under endocarditis, were merely anemic. It is to the loss of blood that we should then refer the bellows' and rasping sound then heard in the præcordial region. The very striking differences, however, which exist between the abnormal sounds of chlorosis and anemia and those of endocarditis can scarcely be confounded with each other. In the former affections, the abnormal sounds are heard in the carotids, or in some other arteries: when they exist in the præcordial region, they are lighter there, occupy chiefly the base, and in all cases they appear at the same time, and with much greater intensity in the carotids. This is a differential character of great importance, and one to which M. Andral attaches considerable value.

In anemia, the bruit de soufflet appears after the employment of blood-letting, and this alone is sufficient to distinguish it from that appertaining to endocarditis.

Treatment.—M. Bouillaud is of opinion that greater promptness and decision in practising venesection are required in this affection than in pericarditis, and also that more copious depletion becomes necessary. With respect to the promptness and decision with which this measure should be employed, I perfectly coincide with him, as the great danger is, the effusion and subsequent organisation of coagulable lymph, which may afterwards occasion permanent impediments to the circulation, and so give rise to the most disastrous results. Against the great extent, however, to which he recommends blood to be taken, I enter my decided protest, and that for many reasons,—among others there is this: in my observations on the treatment of pericarditis, I remarked that blood, passing through an inflamed membrane, either of the heart or of an artery, evinced a tendency to coagulation. With this impression on my mind, I would feel very reluctant in carrying venesection so far as to induce either syncope, or a state approaching to it, lest, by thus retarding or momentarily suspending the circulation of the blood, I should favour the above-mentioned tendency to coagulate, and so promote the deposition of lymph and the formation of polypous concretions, which might at length be converted into permanent obstructions. For the rest of the treatment of this affection, I must refer to that recommended by me for pericarditis, the principles of treatment of these two maladies being absolutely similar.

CARDITIS.

The confidence with which some medical writers detail the symptoms of inflammation of the muscular substance of the heart, would lead one to suppose that their acquaintance with the history of this organ, when attacked with inflammation, was on precisely the same footing, and of as long standing, as their knowledge of the lung, liver, or any other organ of the body when inflamed; and yet it is not so long ago since the illustrious Laennec himself stated, that there does not exist a single well-authenticated and well-described case of general inflammation of the heart, either acute or chronic. In the "Medico-Chirurgical Transactions for 1816," there is given a case of inflammation of the muscular parietes of this organ occurring in a young boy, which bears the impress of being genuine. The account of the symptoms during life was extremely defective; the nature of the case having been entirely misunderstood by the practitioner in attendance. After death, when the heart was cut into, its fibres were found to be dark-coloured, soft, and easily separated. On closely inspecting the cut surface, collections of dark pus could be seen in different parts, quite distinct from each other. Meckel mentions another case of true carditis.

Modern practitioners readily admit the existence of a true carditis as distinct from inflammation of either of the surfaces of this organ, but still accompanied, for the most part, by inflammation either of the endocardium or pericardium. The inflammation may commence either in one of these last-mentioned surfaces, which is the most usual, or in the substance of the heart itself; or the commencement in both may be cotemporaneous. The following is the description given of carditis by Professor Horn, of Berlin:—Anguish, distress, and restlessness indescribably great: the patient constantly complains of a more or less violent painful sensation in the region of the heart; pulse extremely frequent, temperature of the body diminished, extremities cold, face generally pale and expressive of deep internal suffering. With these symptoms, which may be considered as exclusively appertaining to the heart, others are generally found to be associated, which are, for the most part, referrible to other organs, more particularly to the lungs and their investing membrane, it being well known that carditis is often complicated with pleuritis and pneumonia: the principal of these are dyspnœa, hæmoptysis, and cough. Some of the symptoms accompanying this affection are of a sympathetic character; among these may be classed vomiting, syncope, delirium, pains in remote parts of the body. The presence or absence of these will depend, in a great measure, on the intensity of the disease, and the idiosyncracy of the patient. Some writers have divided carditis into acute and chronic. Such a division can only be warranted when symptoms characteristic of each can be adduced. It is impossible, however, to do so in the present state of science. A more useful, because a more practical, division of carditis has been proposed, viz., into the simple and complicated forms of the disease. The simple form is rather uncommon. Dr. Baillie states that he met one case of it, in which no trace whatever of pericardial inflammation could be discovered.

It is but just to state, that the most distinguished pathologists of the present day have declined the attempt to detail the symptoms of carditis as distinguished from inflammation of the pericardium and endocardium. Pain in the heart, which is very acute, and has been compared to that of a burning sensation, and which is increased by pressure on the intercostal spaces, and over the epigastrium, has been set down by some as indicating inflammation of the muscular substance of the heart. Having said thus much on the symptoms of carditis, we may now consider its *anatomical characters.*

With respect to the tissue primarily affected by inflammation in carditis, it is acknowledged that the instances are very rare wherein such inflammation is confined to the fleshy substance of the heart. I entirely concur with Corvisart in believing, that in this affection the cellular tissue connecting the different layers of muscles which constitute the substance of the heart, and that likewise connecting the different fibrils of these muscles, is more essentially the seat of this inflammatory action in the first instance. When the endocardium is in a state of inflammation, such inflammation is propagated or transmitted through the subserous cellular tissue to that connecting the different muscular fibres, and not to the tissue of the heart itself; for the difference of tissue is an obstacle to the transmission of the inflammatory state to the fleshy substance of the heart, precisely in the same manner as we rarely see inflammation of the arachnoid membrane extend to the dura mater. For the same reason, also, in pericarditis the inflammation of the serous structure is seldom propagated to the fibrous tissue of this sac.

Softening and Suppuration.—These, of course, are not the anatomical characters of the early stage of carditis; they are but two degrees or forms of an alteration essentially the same. When the heart is in a state of softening, its substance may be crushed into a pulp by pressure with the fingers. The colour of the heart, when so affected, may be reddish or brownish: sometimes it presents a pale or dirty white colour; this is supposed to characterise a more protracted stage of chronic inflammation. Pathologists, however, are not agreed concerning the origin of these changes; some considering them to be inflammatory, others cachectic. Collections of pus are occasionally discovered in the substance of the heart; these may either exist in immediate contact with the tissue of the organ, or may be enclosed in a cyst. Such abscesses may either open into the chamber of the heart, or externally into the pericardium.

When the heart is the seat of *ulcerations*, the endocardium is almost invariably the tissue primarily attacked, and the part of the heart which is the seat of the ulceration is more frequently the left ventricle. These ulcerations vary considerably as to their depth. An aneurysmal cyst is observed to form consecutively to the ulceration, as in the case of an artery. The size of this tumour varies from that of a filbert to that of the heart itself. When complete rupture of the ulceration takes place, the consequences will vary according to the part of the heart ulcerated. If it occur in the parietes of the organ, it will be followed by fatal effusion into the pericardium. It generally happens, however, that the aneurysmal cyst forms adhesions to the adjoining layer of the pericardium, which accounts for the paucity of the cases of rupture of these tumours.

Induration of the heart is another morbid change found in this organ as a result of inflammation. The seat of this hardening is either the muscular tissue, or the intermuscular cellular tissue. The induration assumes various degrees. Sometimes, the consistence of the organ is fibrous or tendinous; sometimes cartilaginous. Broussais found the heart so hard as to resemble a cocoa-nut.

With respect to the *diagnosis* of carditis, both Corvisart and Bouillaud avow their inability to distinguish the disease from pericarditis or endocarditis. It is not, however, so difficult to distinguish carditis from pneumonia or pleuritis. The patient labouring under pneumonia complains of considerable oppression, as well as of pains, or rather stitches, on one side, or on both; these stitches extend over a much greater surface than the local pains in the subject of cardiac disease. The pneumonic patient can lie down with much more ease; at least, he is exempt from that peculiar characteristic distress on assuming the recumbent posture, from which the cardiac patient is known to be so great a sufferer. The patient with pneumonia is more annoyed at taking in a deep inspiration, or in speaking aloud, than the patient with cardiac disease. Speaking, also, will bring on cough and dyspnœa in the pneumonic patient in a very manifest manner. There is about the cardiac patient a sort of hastiness of temper, in which he occasionally shrieks aloud, and indulges in the frequent repetition of one and the same word, as if in a delirium. The absence of abnormal pulsations, or of pain in the cardiac region, will assist in the diagnosis. In general, the pneumonic patient is not so pale as the cardiac. His face and extremities are warm, and often hot; not so with the cardiac sufferer. The state of the pulse, also, may help: in pneumonia the pulse is often full, and rarely ever so small as to be imperceptible to the finger; nor is it ever so frequent as in carditis. The difficulty of diagnosis will be increased when both lungs are inflamed, as several of the phenomena ordinarily observed in carditis will then be presented, from the circumstance of the pericardium itself then participating in the inflammation. In such a case, the difficulty will consist not so much in ascertaining the existence of the pneumonia, as in detecting the simultaneous presence of the carditis. Such is the differential diagnosis of Prof. Horn.

With respect to the *termination*, it may be safely stated, that in its ordinary or complicated form with pericarditis or endocarditis, the result is nearly always fatal. Corvisart positively states, that in its acute form it has never been cured. Broussais considered it, when not complicated, to be within the reach of art. Injudicious treatment may lead to hypertrophy, with or without attenuation; as also to atrophy, &c.

On the subject of the *ætiology* of carditis, it is precisely similar to that of pericarditis and endocarditis. The same observation will hold good with respect to the *treatment*.

HYPERTROPHY OF THE HEART.

In a preceding portion of this work, viz. the part which treats of diseases of the heart in general, I have alluded in an abstract way to the occurrence of hypertrophy of the organ, and the causes which more particularly lead to this event. I shall now enter on the consideration of this important subject much more in detail. Hypertrophy of the heart is ordinarily defined to be *an increase in the muscular structure of the heart from augmented nutrition.* To this definition we might take some exceptions were we disposed to verbal criticism; we may object to it, in the first place, because the definition of a thing has nothing to do with the *causes* of it, and in the next place, I consider the definition as too exclusive; inasmuch as the other tissues which enter into the structure of the heart are as capable of hypertrophy as the muscular tissue; perhaps it might be safer both logically and pathologically to define the term "an increase in the substance and volume of the heart." As pathologists, however, generally restrict the term hypertrophy, in the case of the heart, to its muscular structure, I shall, in conformity with the usage, confine myself to the consideration of this structure exclusively. An enlargement of the muscular substance of the heart, arising from excessive and long-continued exertion of this muscle, has nothing in it that need at all surprise us. Similar phenomena present themselves in other muscular parts, which have been subjected to excessive action. We have an instance of the same muscular development in the arms of the professor of gymnastics, or the fencing-master, or other persons, who have been long accustomed to exercise the muscles of the upper extremities almost exclusively. The muscles on the back of the leg of the opera-dancer afford another instance of the effect of extraordinary action on the size of muscle. And it may be observed here, that the size is not the only quality of the muscle which becomes changed by such excessive action. Its consistence also is considerably altered; it now becomes tense and rigid to an extraordinary degree. Modern pathologists attribute this great enlargement of muscle to increased nutrition;—the existence of the latter function being very naturally inferred from the necessity there is for it,—increased exertion in the muscle requiring an increased deposition of nutritive particles. Examples of a similar mode of arguing, viz. inferring an increase of any function from the necessity there seems to be for such increase, are of frequent occurrence in physiology and pathology; how often do we say, on observing the removal of any morbid deposition from a part, that the function of absorption in such part must have been increased? This mode of reasoning, it may be admitted, borders very closely on what logicians call a *vicious circle;* that is, proving a thing by itself. Some of the old pathologists thought they saw something more than augmented nutrition in this enlargement; they contended, that in such cases a vitiated state of the fluids must be admitted. Lancisi it was who maintained this opinion; he compared such enlargement to the same effect produced in other viscera by obstruction and stagnation of the fluids. But, as Bouillaud correctly remarks, Lancisi here confounded two things entirely different from each other, scil. increase in the size of an organ by simple increase of healthy nutrition with the same increase induced by morbid alteration. The term *hypertrophy*, in etymological strictness, obviously implies nothing more than over-nutrition, and does not by any means involve the idea of there being any change whatever in the chemical qualities of the hypertrophied tissues. There is considerable difference between the proximate cause of enlargement in the heart and in the liver. What I would say is, that where the increased size is accompanied with a change in the tissue or texture of the part, the term hypertrophy is not correctly applicable. Enlargement of the heart, as we have now viewed it, may be connected with an increase in the nutrition of this organ; the same change in its external surface may also arise from another cause,—widening of its cavities.

To this latter alteration the name of *dilatation* has been given. It frequently happens that these two changes, viz. hypertrophy and dilatation, will depend on one and the same cause, the principal one being some impediment existing in the course of the circulation, and beyond the part of the organ affected. The heart may present three forms of hypertrophy; in the first form, the parietes of one or more cavities of the organ are thickened, without any change whatever in the size of these cavities; to this the appellation of *simple* hypertrophy has been assigned. In the *second* form, the parietes of one or more cavities become thickened with an increase in the size of such cavity. This is called *excentric* hypertrophy. It admits of two varieties; in the one we have thickened walls with dilated cavity; in the other the thickness is normal, whilst there is dilatation of the cavity.

In the *third* form we have thickening in the walls of the cavities, with diminution in their size. This has been called *concentric* hypertrophy. The second form, or *excentric* hypertrophy, corresponds with the *active aneurysm* of Corvisart. This is the most common of all the forms. The existence of concentric hypertrophy has been disputed by several practitioners, more especially by Cruveilhier, who admits its occurrence only as a congenital defect; he thinks that the phenomenon depends altogether on the kind of death the patient may have died. He found that the hearts of those who died a violent death, as by the guillotine, presented this double appearance of hypertrophy and narrowing of the ventricle. "The hearts," he says, "marked with concentric hypertrophy, were hearts which death had surprised in all their energy of contractility." To warrant us in pronouncing any given specimen to be one of concentric hypertrophy, three things are necessary: 1st, that the parietes be thickened; 2nd, that the dimensions of the cavity be diminished; 3rd, that the volume of the heart be either normal or enlarged. When with the first and second changes the size is diminished, the whole phenomenon may be caused by spasmodic contraction in the death-struggle. We shall see presently that the other two forms of hypertrophy (the simple and excentric) can be accounted for on mechanical principles, whilst the production of such an effect as concentric hypertrophy will not admit of any such explanation. Bouillaud strenuously asserts the existence of concentric hypertrophy, and adduces several cases in proof of its occurrence.

In order to be able to recognize an enlargement of the heart, it is obviously necessary to understand the physiological or healthy condition of the organ in reference to size and weight. The following data may be useful as a guide: M. Sanson assigns eight ounces for the average weight of the heart. M. Cruveilhier estimates it at from six to seven ounces. M. Bouillaud, however, gives the weight to be from eight to nine ounces in the adult of from twenty-five to sixty. With regard to the size of the heart, Laennec and

Bouillaud agree in stating that it should equal nearly the size of the individual's fist. Many persons, however, deny the accuracy of this comparison. M. Bizot has endeavoured to throw some light on the varying dimensions of the heart at different ages. It increases, he says, during the early period of life, as well as in the following periods, and this indefinitely. This increase is very striking both in length and breadth. As far as twenty-nine, the increase is more rapid than during the following periods. The indefinite increase of the heart here stated, should make one rather cautious in pronouncing the heart of an aged person to be hypertrophied. The organ is in general smaller in the female than in the male. Some pathologists will have it that it is usually hypertrophied in those who die of phthisis. This seems to be the opinion of Laennec and Bouillaud. M. Bizot's experience, as well as my own, on the contrary, lead to the conclusion that it is smaller in tubercular cases.

According to M. Bizot, the stature of the individual does not exercise much influence over the size of the heart. The slight difference which does exist, seems, in fact, to prove that in both sexes the absolute size of the heart is a little less in those who are tallest.

Influence of Age on the dimensions of the Ventricles.—The capacity of the ventricles goes on increasing regularly during youth: after fifty, however, such increase is no longer perceptible. The right and left ventricles are more broad than long. The average breadth of the left ventricle may be set down as about 31 lines from one to four years of age, 51 from sixteen to twenty-nine; whilst that of the right ventricle, from one to four years, is 48 lines, and from the age of fifty to sixty it is 60 lines.

The average thickness of the left ventricle when measured at its thickest part, scil. at the base, according to Bouillaud, is from six-and-a-half to seven lines, and that of the right, two-and-a-half lines. Thus, contrary to Laennec's statement, the thickness of the parietes of the right ventricle is to that of the left nearly as two to five, or as one to three. Laennec made them almost as one to two. In the foetus, and in early infancy, such disproportion never will hold. The thickness of the left auricle is about one-and-a-half line, and that of the right, one line. The capacity of the right ventricle exceeds somewhat that of the left. The capacity of the right auricle also exceeds that of the left. Having thus briefly considered the weight and size of the heart, and the relative capacity of its chambers in the normal state, we may state in a few words the changes occasioned by disease. The degree of hypertrophy cannot be judged of from the volume of the heart, since the volume may be great, though the walls may be actually attenuated, as in the case of dilatation with thinness of the parietes. The heart may actually attain a size triple its normal one. The weight also has been found triple of its ordinary weight. We have stated above that hypertrophy more frequently affects the left ventricle. The auricles also may be thickened in their parietes, and may have their cavities enlarged. Laennec considers these two conditions in the auricles almost inseparable.

It is obvious that we must not estimate the capacity of the cavities by the volume of the heart. Thus, when both the ventricle and the carneæ columnæ are hypertrophied, the cavity must be contracted. If, under these circumstances, the right be the one affected, it descends lower than the left, and the apex seems to belong to it, whilst in the normal state the apex of the heart is constituted by the left ventricle. When the left ventricle is hypertrophied, and its cavity is dilated, the right appears to be merely appended to the left. According to Bouillaud, when the interventricular septum is hypertrophied, the entire of it generally projects into the right ventricle.

Hypertrophy of the heart must produce more or less change in its relations to the organs surrounding it; the lungs are of course pushed out; the base of the heart ascends towards the clavicle, and its apex descends towards the seventh and even eighth intercostal spaces; the heart undergoes a displacement which gives it a sort of transverse position, the auricles inclining to the right, and the apex to the left, side.

Anatomical Characters.—Many of the phenomena would have a tendency to incline one to the belief in the inflammatory origin of hypertrophy: the muscular structure presents a very deep red colour, the coronary vessels are increased considerably in size, the tissue also is much firmer. That form of hypertrophy which is accompanied with dilatation, is the most frequent of all; and it is when this combination exists that the heart attains its largest size; it is then sometimes found to equal three times the natural standard; its shape also becomes rounded in consequence of the obliteration of the apex. The form to which the name of simple hypertrophy is given, is the rarest of any.

In the case of simple and dilated hypertrophy the increased thickness of the walls seems to proceed from the apex towards the middle portion of the ventricle, from whence it diminishes towards the openings of the great vessels. The increased deposition in the parietes which are hypertrophied, is by no means always uniform; it is frequently greater in one part than in another. The septum is not so often the seat of hypertrophy as the parietes; the carneæ columnæ are oftentimes enlarged; but where the cavity becomes much dilated, they present appearances of attenuation rather than of thickening.

Symptoms.—These are either *local*, or *general.* The local symptoms, or physical signs, may be ascertained by inspection, palpation, percussion, and auscultation. In the case of considerable hypertrophy, the ribs, and clothes on the chest, and sometimes even the sternum, are perceived to be forcibly raised by the pulsations of the heart; the movements of the organ may be observed over a large space on the left side of the thorax and towards the epigastrium. The rising is most evident at the part where the apex strikes the ribs. Though the heart may be much hypertrophied, still its impulsion may not be always visible in consequence of a portion of the lung covering it, and so preventing its pulsations from reaching the parietes of the chest. For the purpose of rendering the impulsion more evident, recourse may be had to an instrument proposed by M. Herisson, and to which he has given the name of *sphygmometer*. Among other uses to which it may be applied, it is considered as capable of enabling the practitioner to ascertain some of the organic diseases of the heart, and to diagnose the different varieties of them. I shall here present a few of the sphygmometrical characters discovered by M. Herisson in persons labouring under hypertrophy of the heart, without or with narrowing of the orifices:—

I.—*Hypertrophy without narrowing.*—1. With thickening of the parietes and diminution of the capacity of the left ventricle—*impulsion abrupt, arterial resistance very strong.* 2. With thickening of the parietes, and increase in the capacity of the left ventricle—*impulsion very strong, marked inequality, resistance very great.*

II.—*Hypertrophy with narrowing of the right auriculo-ventricular orifice, or ventriculo-pulmonary narrowing:* pulse irregular, unequal, intermittent: the column of mercury (in the instrument) *hesitates* before rising; and when it has set off, it does not always re-descend to its point of departure, or re-descends only in two different times. For fuller information on this important subject, I beg to refer the reader to the New Translation of Laennec's Treatise on Mediate Auscultation—1846.

Inspection will sometimes enable us to detect an arching or prominence of the ribs and sternum in the region corresponding to the hypertrophied organ. Together with bulging of the ribs and sternum, a widening of the intercostal spaces is also perceptible. This prominence of the ribs is more striking in young persons. Senac considers it congenital in such cases, whilst M. Piorry believes it may depend on a deviation of the vertebral column to the left and forwards, which will of course cause the ribs to be carried in the same direction.

In case of considerable hypertrophy, by applying the hand to the præcordial region, a shock may be felt, not unlike the blow of a hammer. This is caused either by the entire body of the heart, or only by its apex. During auscultation, the head is repelled in a similar manner at the moment the ventricle contracts. Under the same circumstances also, the apex of the heart will be found to deviate more to the left than it does in the normal state, and to raise the sixth, seventh, or even eighth intercostal spaces, whilst the movements of its base correspond to the third or even as high as the second. The results of percussion are very satisfactory in hypertrophy of the heart; but to derive all the advantages which it is capable of affording, we must be aware of its effects on the cardiac region in the normal state. We should recollect that the dulness ascertained by percussing the cardiac region where the heart is healthy, extends over a space about two inches square; the extent over which the dulness will be perceived beyond this, will depend on the amount of the hypertrophy, as well as on the increased size of the cavities, or, in the precise language of Bouillaud, will be in a ratio compounded of the hypertrophy and dilatation of the heart.

Immediate auscultation affords very valuable signs for diagnosing hypertrophy of the heart. By immediately applying the ear itself to the præcordial region, we may ascertain with great clearness the degree of the heart's impulsion, as also the extent and intervals of its pulsations. As I have already stated, this impulse, when communicated to the head of the practitioner, is so strong as to raise it at each contraction of the ventricle, with a force proportioned to the degree of the hypertrophy.

The sounds of the heart undergo considerable modification according to the nature or form of the hypertrophy; this will appear obvious, when it is considered that the thickened state of the ventricular walls cannot be at all favourable for the transmission of these sounds: thus the first sound is duller and more prolonged than in the normal state, and this in proportion to the thickening of the ventricle. If the hypertrophy, however, be moderate, and the cavity of the ventricle be either of the normal size, or augmented, these sounds are not only not diminished, but are actually more distinct and stronger than natural, being oftentimes extended over a considerable part of the chest, and even as far as the posterior portion of this cavity. If the hypertrophy be very great, whilst the cavity is at the same time diminished, the sounds become very indistinct, if not entirely imperceptible. When the hypertrophy is simple and moderate, the second sound of the heart is not much changed, whilst in the concentric form it is lessened, and in that attended with dilatation it is somewhat augmented. The force of the shock or impulse varies directly as the thickening and inversely as the dilatation; whilst the clearness or distinctness of the sound varies directly as the dilatation and inversely as the thickening. In some cases a slight bellows' sound is occasionally distinguished in cases of pure and simple hypertrophy; it is only during an attack of palpitation, however, that it is discernible—its effect is to obscure the natural sounds of the heart. When the bellows' sound is constant and very distinct, it indicates almost with certainty the existence of some complication. The frequency of the cardiac pulsations is not much increased, at least in the commencement of the affection, save from some external cause; neither will their regularity be much interfered with, unless the hypertrophy be complicated with some other disease. There is no actual pain complained of in the præcordial region in case of hypertrophy of the heart; but when the affection has attained a great height, the patient feels a sense of weight or uneasiness in this region, as well as in the pit of the stomach. We now come to the general or indirect symptoms and signs of hypertrophy, commencing with those affecting the circulation. In simple and excentric hypertrophy the pulse is strong, full, free, and vibrating; whilst in the concentric form it is small, and as it were compressed. In the case of pure and simple hypertrophy the countenance is florid, the eye bright, the animal heat is a little greater than natural, and there is a tendency to active hæmorrhage. It is scarcely necessary to remark that the examination of the pulse furnishes no immediate or direct signs, except for hypertrophy of the left ventricle. The pulse is so much modified by the lesions which sometimes complicate hypertrophy, that no great reliance can any longer be placed on it for detecting the hypertrophy itself. Where the latter is pure and simple, without any narrowing of the orifices, or disease of the valves, or any serious organic lesion of any of the great vessels, the venous circulation goes on with perfect freedom; and no passive congestions, whether of blood or serum, are observed to take place; nor do any effusions occur. It is only where the hypertrophy is complicated with other lesions capable of opposing some obstacle to the free course of the venous blood, that such effects are produced. As long as the hypertrophy is slight and uncomplicated, the *respiration* continues free. But when the heart becomes much enlarged, occupying nearly a third or a fourth of the space reserved for the lungs, then the patient complains of dyspnœa, occasioned no doubt by the impeded circulation through the heart, and the infarction of the lungs and infiltration consequent thereon. *Cough* is generally observed to come on after pulmonary congestion has taken place; but rarely ever in the commencement of the disease. The œdema following hypertrophy, and occasioned by the impeded circulation through the heart, as has been already noticed, is first observed in the face and eyelids. The effects of hypertrophy of the heart, or the signs accompanying it, have been sadly misrepresented by some of the older pathologists. Symptoms have been assigned to it, which have no connection whatever with such a morbid change; such as a purplish injection of the face, engorgement of the venous capillaries, dropsy, &c. Such symptoms cannot be set down as the effects of hypertrophy; they are obviously referrible to some impediment to the circulation. True it is these symptoms are frequently observed in individuals with hypertrophied heart; but in such cases they are to be accounted for by those complications so often found to accompany the hypertrophy, such as disease of the valves, narrowing of the orifices, and the other sources of impeded circulation. The effects of hypertrophy are to stimulate, and not to impair, the various functions: it has been already observed, that under its influence, at least in its earlier stages, the eye becomes brighter, and the face more florid than ordinary. When this hypertrophic state has lasted for some time, occasional flushings of the face are noticed, likewise a disposition to active hæmorrhages, whether from the brain, or the mucous membranes of different parts of the body,—as the Schneiderian membrane, and the mucous lining of the intestines. So long, however, as the hypertrophy is pure, and none of these affections which too often complicate it, and which are known to impede the circulation, are present, none of those symptoms once supposed to characterize it, such as the purplish cast of countenance, are ever observed.

What has been hitherto said regarding the signs of hypertrophy, applies strictly to the ventricles only; the signs of auricular hypertrophy cannot be set down with the same certainty; but the fact of their frequent co-existence renders their distinct and separate diagnosis of little importance in a practical point of view.

We shall now direct attention to the means of ascertaining the precise cavity which may be the seat of hypertrophy. And with respect to the *left* ventricle, little need be added to what has been already stated, as, in detailing the several signs of hypertrophy in general, reference was had more especially to hypertrophy of that cavity. The following is a summary of those signs: pulse full, strong, and thrilling—impulsion of the heart feels very forcible both to any person who lays his hand over the præcordial region, as well as to the patient himself; pulsations of the heart, felt at the cartilages of the 5th, 6th, 7th, and even 8th ribs; it is in this region also that the dulness and prominence already alluded to are most marked—the contraction of the ventricle is duller and more prolonged than natural; besides being distinctly audible in the region just mentioned, this contraction may be heard also under the clavicle, if the hypertrophy be simple or concentric; but when it is excentric, the contraction is heard beneath the clavicles, on the sides, and even a little towards the left side of the back; to these may be added the clear red colour of the face; the bright eye; flushes of heat towards the face and head, stupor, &c. Hypertrophy of the *right* ventricle is characterized by the following signs: pulse neither so strong nor tense as in the preceding form, unless the left ventricle be also hypertrophied (which is common enough); the beatings of the heart are felt chiefly beneath the lower part of the sternum; the dulness is likewise most perceptible in this part; there is here also more or less of dyspnœa, cough, and sanguineous expectoration. Should the hypertrophy be accompanied with dilatation, and any valvular insufficiency be thereby occasioned, a reflux, and fluctuation of the jugulars, will also be perceived. M. Bouillaud remarks, that the *venous pulse* observable in such cases is not at all connected with the hypertrophy of the right ventricle, but that if it should co-exist, it must arise either from extreme dilatation of the auriculo-ventricular orifice, or from some lesion occasioning insufficiency of the tricuspid valve.

The connection between disease of the heart and cerebral and pulmonary apoplexy, has been frequently noticed by pathologists. No doubt whatever is now entertained of the close dependence of cerebral apoplexy on organic disease of the heart, more especially of its left ventricle. Hæmorrhage, however, is not the only morbid effect of disease of the heart on the brain; softening of the substance of the latter organ may be the result, as also serous effusions either into its ventricles or between its membranes: nor is the production of all these effects due exclusively to the agency of the left side of the heart; they may be connected likewise with obstructed circulation through the right side of the heart.

The occurrence of ossification and frequent morbid changes of the vessels within the head in persons in whom hypertrophy of the left ventricle is found to exist, must no doubt have considerable share in causing a fatal termination by cerebral hæmorrhage.

Pulmonary apoplexy also has been shewn to depend on a hypertrophied state of the heart, more especially however of its right ventricle, which produces this effect by the same mechanism by which hypertrophy of the left ventricle occasions apoplexy in the brain. When the right ventricle has attained an increase of size, and a proportionate augmentation of strength, the blood is propelled through the vessels of the lungs with so much force, as sometimes suffices to distend them to an inordinate degree, and to cause a rupture of their parietes. The great influence attributed to hypertrophy of the right ventricle in occasioning pulmonary apoplexy, has been questioned by one or two recent writers, who seem disposed to accord a larger share in the production of this affection to impeded circulation through the lungs, arising from narrowing of the left auriculo-ventricular orifice, or from a rigid state of the mitral valve. The connection between pulmonary apoplexy, and a hypertrophied condition of the heart, does not seem to have been duly recognised by the older pathologists, inasmuch as the existence of pulmonary apoplexy itself, as a form of disease, has not been long known. One of the earliest notices we have of it is an Essay über den Lungenschlagfluss, nebst einer Einleitung über Schlagflüsse uberhaupt, (On Apoplexy of the Lungs, with an Introduction to Apoplexy in general,) from the pen of Dr. Hohnbaum, in 1817, two years before Laennec brought out the first edition of his great work. I may here mention that this is the same physician who published a German translation of my work on Consumption, in the year 1835.

The older pathologists were long aware of the influence of hypertrophied heart in inducing an enlarged state of several of the abdominal viscera, more especially of the liver and spleen; the kidneys too have been found more voluminous than normal under such circumstances. I have on very many occasions pointed out to my pupils, and others, instances of enlarged kidneys coinciding with disease of the heart, and depending no doubt on the congested state of the entire venous system—a state which may occur in any form of cardiac disease capable of producing obstruction to the circulation.

Causes of Hypertrophy.—It is generally supposed, and not without good reason, that inflammatory action, set up either in the lining membrane of the heart, or in its investing membrane, the pericardium, is capable of producing hypertrophy of the organ, by stimulating the nutritive vessels of the muscular layers adjacent to them, the concentric form being produced in the former case, and the simple in the latter instance. For the production of the excentric form of hypertrophy, the combined influence of inflammation, and obstruction to the circulation through the heart, would appear to be necessary. This view of the matter seems to derive considerable support from the analogy of the bladder, stomach, &c., becoming thickened after an inflammatory process has been going on in them for some length of time. All circumstances occasioning or requiring unusual exertion on the part of the heart,—such as obstructions in the lungs, or in the great vessels, which, by hindering the free circulation, call forth increased efforts on the part of the heart, in order to overcome the obstruction,—adhesions of the pericardium, by encumbering the free action of the heart,—may also lead eventually to the same result. Among the causes may also be enumerated strong mental emotions of frequent recurrence—violent and frequent palpitations, from whatever cause induced,—a too rich and stimulating diet. Many of the circumstances calling for increased exertion on the part of the heart, may be set down as mechanical causes: these are, morbid changes in the valves or orifices, or excrescences on these parts,—a narrowed or dilated state of the aorta,—a congested state of the lungs, or any abnormal alteration in these organs which may interrupt the circulation through them, —convulsive affections of the lungs, as asthma, &c.

Though this disease is generally chronic in its formation and duration, still, instances are mentioned wherein it is stated to have become developed in a very few weeks. When the disorder is much aggravated in degree, and complicated with any cause which may occasion serious obstruction to the circulation, the prognosis is decidedly very unfavourable. But when no such complication exists, and the affection has not assumed excessive development, by observing a very temperate, regular, and quiet mode of life, the patient may attain an advanced age, with little other annoyance except occasional palpitation or dyspnœa.

Treatment.—When undertaking the treatment of hypertrophy, many circumstances require to be taken into consideration; as the variety of the hypertrophy —the constitution and age of the patient—the state of the pulmonary organs, whether they are healthy, or not. In the simple variety, or in that wherein the hypertrophy predominates very much, *sanguineous depletion* has been recommended, and its occasional repetition enjoined, according to circumstances. To carry vascular depletion, however, to the extent practised by the Italian physicians, Valsalva and Albertini, I consider extremely dangerous. Laennec appears to approve of a modified adoption of Valsalva's method—his plan was, to employ venesection twice or thrice a week—this he continued until he ascertained that the abnormal impulsion and the palpitation of the heart were subdued. Bouillaud's method of treatment, with respect to blood-letting, is not very different from Laennec's—he recommends the employment of cupping also over the præcordial region. The regulation of diet formed one of the most important parts of Valsalva's mode of cure; this consisted in allowing the patient merely as much food as was necessary to sustain life, and was accompanied by absolute confinement to the bed. British practitioners, however, do not at all coincide in this view of treatment. For my own part, I see no necessity whatever for the profuse expenditure of the vital fluid. I derive the most decided advantages from the occasional application of a few leeches to the cardiac region. The effects of this method are, to tranquillize the violent palpitations and excessive impulse of the heart, and to abate the distressing dyspnœa. The exhibition of slightly nauseating doses of tartar emetic I have also found beneficial, in quieting the inordinate action of the heart. The employment of digitalis in the form of tincture, serves to produce the same result; so highly does M. Bouillaud think of its powers in this way, that he styles it the true opiate of the heart. With respect to the endermic method of employing digitalis, I can say nothing from my own experience. It consists in sprinkling from five to fifteen grains of the powder over the surface of the skin, the part to which it is applied having been previously denuded by the application of a blister. The other internal medicines employed in this affection are—mercury, (as an alterative,)—colchicum,—iodine (for its influence on the function of absorption), and chiefly in the form of hydriodate of potash. Diuretics also should be administered, even before the occurrence of dropsical effusions, in consequence of their power to diminish the quantity of the circulating fluid, to prevent serous deposition, and dyspnœa, and to assuage the irregular contractions of the heart. When serous effusions have actually taken place, as indicated by the œdematous state of the face and extremities, the more energetic diuretics, or, what is still more beneficial, a combination of several of them, should be employed. For this purpose, calomel, digitalis, and squill, may be administered in the form of pill once or twice a day, or oftener if necessary,—to be accompanied by a diuretic draught, consisting of compound spirit of juniper with sweet spirit of nitre in camphor mixture, or in the decoction of dandelion or of the spartium scoparium. There is a peculiar property in diuretics which the practitioner would do well to keep in view; it is, that they are extremely variable in their operation; hence, when those first employed disappoint, others must be substituted. There will be no difficulty, however, in doing this, as the materia medica supplies us well with medicines of this class. Should those just now specified fail, we may introduce others, as the nitrate and acetate of potash with the infusion of juniper: the patient should take the solution of cream of tartar as common drink. Purgatives, and more especially those of the hydragogue class, ought not be neglected. Tartarized soda, or sulphate of soda or of magnesia, in such doses as may produce two or three copious and watery stools, might be administered every other day. The employment of issues and setons has been sometimes found beneficial; they are best placed in the vicinity of the cardiac region, near the margins of the false ribs. With respect to diet, the utmost moderation should be observed both in its quantity and quality, every thing of a stimulating nature being strictly prohibited. When, however, in the progress of the disease, symptoms of great debility and exhaustion appear, a modified tonic treatment will be imperatively required. In conclusion, I must impress on the mind of the practitioner the indispensable necessity of enjoining repose of both mind and body, without the diligent observance of which every other effort must prove unavailing.

ATROPHY OF THE HEART.

I have already stated that the average weight of the heart in the adult male, in the normal state, is from eight to nine ounces. Hearts, however, have been found to weigh only from six to seven ounces; such hearts are said to be atrophied. The wasting process has gone so far as to reduce the organ to one half, or even one-third of its normal weight. Burns mentions a case where the heart of an adult did not exceed in size that of a new-born infant. We must take care not to confound with atrophy the apparent diminution of this viscus, occasioned by strong contraction of it in the last agony. Atrophy may present itself under three forms. 1st. The parietes of one or more cavities may be attenuated without any change in their dimensions, so that the size is but little diminished ; this may be called *simple* atrophy. 2nd. The parietes may be attenuated with an increase in the size of the cavities; this corresponds to *excentric* hypertrophy. 3rd. The thickness of the parietes may be equal to, or even a little greater than that which is normal, but the dimensions of the cavities are diminished; this form obviously corresponds to *concentric* hypertrophy: it is also the most frequent.

I shall here contrast M. Andral's division of the various forms in which atrophy may present itself, as set down in his work on Pathological Anatomy, with the above, originally proposed by M. Bouillaud:—In the first the normal size of the heart remains, the cavities having gained in capacity what their parietes lost in substance. In the second the volume of the heart is increased, the cavities being more and more dilated in proportion as the walls become attenuated. In the third the size of the heart is less than natural, there being a diminution of the size of the cavities and an attenuation of the walls at one and the same time.

The causes of atrophy may be general or local. The general causes are all diseases of a wasting nature, such as phthisical or cancerous affections, bad fevers long protracted; all causes, in fact, which impede the nutrition of the muscular structures. The local causes assigned are, long continued pressure on the heart from effusion into the pericardium; ossification or other morbid changes of the coronary arteries.

Signs, &c.—In this disease the impulse of the heart is weak, and the region over which its sounds are perceptible is of very limited extent,—a circumstance which mainly distinguishes this morbid change from that in which a weak impulse of the heart results from a dilatation of that organ. The sounds of the heart are so feeble as sometimes to be imperceptible, except when the patient is in a recumbent position. Scarcely any dulness is manifested in the præcordial region. The pulse, in atrophy with diminution of the heart's volume, is small, weak, and thread-like; in atrophy with dilatation, it may be tolerably full, though still soft and weak. Laennec omits to mention any alteration of the pulse in this affection, which, indeed, he was scarcely inclined to regard as a disease. Persons labouring under atrophy of the heart are, perhaps, less subject than others to inflammatory diseases, but they are liable to dropsical effusions, and to syncope, and other affections symptomatic of depressed vital energy. It has been stated by Bouillaud, that whilst atrophy of the heart ordinarily coincides with a state of general emaciation, still the latter condition does not necessarily involve an atrophied state of the heart; hypertrophy of the organ has even been sometimes found to coexist with decided marasmus.

Treatment.—As this morbid state may be the consequence or effect of several other diseases, the consideration of which would be out of place here, I shall only refer for directions as to treatment to the rules prescribed under the head of *Dilatation*. The curative means adopted in cases of dilatation of the heart will in general be found suitable in cases of atrophy. Of course, where the disease has been dependent on the existence of any other morbid change set up in the system, our first object should be to remove, if possible, the primary source of the evil. Where the atrophy is apparently idiopathic, the principal indication—that of restoring volume, tone, and vigour to the wasted organ—will probably be best attained by affording to the body a proper supply of nourishing food, insuring quietude of mind, and administering tonics, as iron in its various forms, the mineral acids, quinine, &c. Camphor, and other diffusible stimulants, may occasionally be required; but it should be borne in mind, that when the disease is dependent on any internal hæmorrhage, stimulants are contra-indicated. The beneficial effects of chalybeates are often best obtained during a residence at some watering-place, where the advantages of change of air, scene, and occupation are valuable auxiliaries to medicine. There also, a salutary amount of exercise is likely to be indulged in, beneficially to the heart, which, like other muscular structures of the body, stands in need of proper exertion in order to be maintained in a healthy condition.

DILATATION OF THE HEART.

I shall now consider dilatation of the cavities and orifices of the heart. With respect to dilatation of the cavities, it may be general or partial, that is, it may either affect the whole of the parietes of a cavity, or only one portion of such parietes. In the case where the entire walls of one or more cavities are affected, we may meet with them either of increased thickness, or of normal thickness, or in a state of attenuation. The two former varieties having been already considered under the head of hypertrophy, I shall now confine myself to the last, or dilatation with attenuated walls, and with impaired function of the organ. This state was called by Corvisart *passive aneurysm, and its anatomical characters* are considerable softening of the muscular fibre, the colour of which is at times pale or yellowish;—sometimes of rather a violet hue. It is deserving of remark that it is more common to find both ventricles dilated simultaneously, than only one; the very contrary happens with respect to hypertrophy. The attenuation sometimes proceeds so far as to leave the ventricle but two lines in thickness; and it has even gone to the extent of allowing a sudden rupture. As may be anticipated, the columnæ carneæ are more separated from each other than in the normal state; it is the breadth rather than the length of the ventricle that is affected in the case of dilatation: hence, when both ventricles are dilated, the heart presents a somewhat rounded appearance, like that of a cup. The auricles are, in consequence of their structure, more disposed to distension than the ventricles; and for a somewhat similar reason the right one is more so than the left. When the auricle and ventricle of the same side become simultaneously dilated, the intervening orifice is also widened, in which case we have valvular insufficiency with all its consequences. As happens in hypertrophy, the position of the heart is somewhat altered in the case of dilatation; its apex inclining more than usually to the left.

The causes of this affection are,—all circumstances of a debilitating nature, as previous diseases of various kinds, inflammatory states of the heart—a scrofulous as well as a cachectic habit of body—an impoverished condition of the blood from poor or insufficient food—rheumatism—phthisis—emphysema of the lung—typhoid and protracted fevers—excessive use of mercury in treating syphilis. According to Laennec, congenital disproportion between the cavities of the heart is an influential precursor of this morbid change. Among the more immediate causes, we may set down over-distension of a cavity arising from some obstruction to the circulation, preventing the free exit of the blood. Here the dilatation is the mechanical result of the over-distension, which, indeed, is itself the effect of the blood accumulated in the cavity from a certain amount of interruption to its exit. The dilatation and attenuation of the parietes consequent on such interruption, will be proportioned to the resistance made, and to the force exerted by the over-distended cavity in order to overcome it. When this force is weak, the walls yield, and the cavity itself becomes dilated; and, generally speaking, it is the cavity immediately behind the obstruction that is first affected. Bouillaud, however, remarks that it is not always the cavity nearest to the obstruction that is first dilated; thus, in case of induration of the valves of the aorta, with narrowing of the orifice, the left auricle may be dilated much more and sooner than the left ventricle itself. The liability of the right cavities to become dilated, is increased by the frequent obstacles to the circulation through the lungs, as for instance hepatisation, or an emphysematous state of these organs.

Among the causes capable of producing dilatation, M. Bouillaud enumerates great muscular efforts of all kinds. The effect of such exertion is to occasion great accumulation of blood within the heart. Violent emotions of the mind, as excessive anger, fear, jealousy, &c.; those pursuits also which require the expression of strong passion,—as the profession of an actor,—contribute very much to the development of permanent distension of the cavities of the heart. All malformations diminishing the cavity of the chest, such as deviations of the spinal column, predispose to cardiac aneurysm.

Another, and, in my opinion, a very influential cause of dilatation of the heart, though not generally recognized as such by practitioners, is profuse loss of blood, whether occurring spontaneously or effected by the lancet. I have had repeated opportunities of seeing this exemplified, and more especially in the case of females affected with menorrhagia. To the effect of such enlargement in arresting pulmonary consumption, I have alluded in my Treatise on that affection. I have already observed that dilatation and hypertrophy of the auricles are in general combined.

Signs.—The signs and symptoms of dilatation, when accompanied with hypertrophy, have been already given under the latter head. In dilatation, attended with thinned parietes, when the expansion is very great, the impulse of the heart is quick, but rather feeble and slight, and more towards the left than natural. According to Laennec, the only certain sign of dilatation of the left ventricle is the clear sounds of the contractions of the heart, heard between the cartilages of the fifth and seventh sternal ribs, the amount of the dilatation being measured by the degree of clearness, and the extent of the sound. The dulness on percussion is increased, unless emphysema of the lung coexist. When the dilatation is very great, the heart's action is sometimes heard even in the dorsal region. Under the same circumstances also, the first sound is as distinct as the second. The left side is the one more especially affected, when the action of the organ is most audible under the cartilages of the lower true ribs on the left side. There is, says Corvisart, a soft and weak pulse, and slight palpitations are present; and the hand feels the impulse of a soft body, which raises the ribs and does not strike them with a quick, short stroke. When the heart's action is most perceptible beneath the lower part of the sternum, the right side of the organ is the one chiefly involved. In dilatation of the right ventricle, according to the same authority, the pulse has nearly the same characters as when the left is implicated, and so have the pulsations of the heart, which are now heard more distinctly on the right near the sternum and towards the epigastrium, than in the region of the heart. To these signs I may add, that the patient complains more of a sense of suffocation, than when the left ventricle is dilated—there is also a more marked tendency to serous effusions; attacks of hæmoptysis are more frequent, and there is deeper lividity of the countenance. Laennec states that, in addition to these signs, an habitual distension of the external jugulars is one of the most constant of the *equivocal* signs of dilatation of the right cavities of the heart—this distension not ceasing even when the vein is compressed on the upper part of the neck. In the more advanced stage of the disease the patient finds himself much weakened, is subject to frequent attacks of dyspnœa, hæmoptysis, and cough, referrible no doubt to the congested state of the heart, and vessels of the lungs, the tissue of which organs moreover becomes infiltrated. The vessels of the brain now become congested, the countenance assumes a purple hue, the patient has terrific dreams and startings from sleep, and at length the symptoms soon give reason for concluding that serous effusion into the brain is about to take place. The venous circulation throughout the entire system becomes obstructed, and as I have already remarked when on the subject of hypertrophy, the abdominal viscera, especially the liver, are liable to great congestion and engorgement. The latter circumstance, by obstructing the portal system, will aggravate the tendency to ascites already present. For the same reason also, occasional hæmorrhages from the mucous membranes in the several parts of the body, as from those of the nose, stomach, bowels, and bladder, are observed to take place, owing, of course, to the congested state of these membranes. In the case of the stomach, the effusion somewhat resembles coffee grounds.

With respect to the signs of dilatation of the auricles, we have none of a *direct* nature. The presence of such a state, however, being in general the result of valvular disease and ventricular dilatation, may be taken for granted, when the signs of these two latter affections exist.

Dilatation of the orifices of the heart is as common as that of its cavities. It admits of various degrees; but to appreciate its extent, we should be well aware of the natural dimensions of these cavities.

Dilatation, when simple and slight in degree, is by no means a very serious affection. The chief inconvenience, in such cases, is, that the individual labours under an habitual shortness of breath, and he is much more readily put out of breath, on any slight exertion, than other persons—palpitations also are very easily excited in such individuals:—however, by adopting a quiet, steady mode of life, and by a strict observance of dietetic and regimenal rules, the affection may be prevented from increasing, and the patient may attain an extreme old age. But when, notwithstanding all our care, both medicinal and regimenal, dropsical symptoms, after being removed for a time, pertinaciously recur, we may rest satisfied that the disease is about to terminate unfavourably. In such cases, the morbid state in which the bronchial mucous membrane is placed, contributes not a little to accelerate the fatal catastrophe.

Before commencing the treatment I wish to observe in contradiction to a modern writer, that where the right ventricle is dilated in consequence of *long standing* pulmonary disease, hypertrophy of this ventricle is sure to follow, provided the patient live any length of time.

Treatment.—The indication to be fulfilled in the first place, is to remove, if possible, the exciting cause. Should the affection be referrible to some obstruction in the circulation through the lungs, and occasioned by any affection of those organs, as hepatisation, emphysema, hydrothorax, &c., our first efforts must be directed to the removal of these states. When the cause of the dilatation, however, is of a more permanent character, such for instance, as narrowing of an orifice, or actual debility of the heart, whether congenital or acquired, we must be content with arresting the further progress of the affection, by adopting a merely palliative mode of treatment, and carefully guarding against the intercurrence of any inflammatory affection of the lungs. It is of the utmost importance, that the circulation be kept particularly tranquil, by adhering to repose both of mind and body. Nutritious diet must be used; yet it should not be of a stimulating quality: it should consist, in fact, of light animal food, taken moderately, as also of the more farinaceous vegetables. Such nutriment is indicated by the impaired energy of the heart, and is calculated to invigorate the organ and enable it better to discharge its functions: but especial care must be taken, that no aliment be prescribed capable of disagreeing with the stomach, or of producing flatulence or acidity; since nothing would be more likely to disturb the heart's action. That we may counteract the injurious effects of the unequal distribution of nervous influence, antispasmodics, such as assafœtida, galbanum, &c., should be occasionally administered. The supervention of even slight catarrhs must be sedulously avoided, and when any such may occur, the greatest attention ought to be given to their speedy removal. The occurrence of such affections requires special and prompt treatment, from their tendency to aggravate the already existing dyspnœa, which forms so distressing a symptom in the disease now under consideration. The vigour of the cutaneous circulation will be sustained and promoted by wearing flannel and worsted stockings. The use of the tepid shower-bath is strongly recommended; it should be tried, however, with extreme caution, and under the sanction of medical advice. If the dilatation has supervened after dissolute habits, venereal indulgence, fevers of a typhoid character, or other depressing causes, the sedulous employment of tonics is imperatively called for. The preparations of iron hold a prominent rank among the medicines indicated in such cases. The chalybeate mineral springs may also be resorted to. With respect to residence, the patient should select a dry and invigorating air, and avoid ascending flights of stairs, or any exercise, whether within or without doors, likely to disturb the action of the heart.

In reference to the quality of the air, however, it may be observed that when the disease is so far advanced and aggravated as to produce congestion of the lungs and bronchi, together with copious expectoration, a warm and humid atmosphere has been advocated, from its known tendency to promote the excretions from the lungs and cutaneous surface: my practice, however, in such cases is to apply two or three leeches either to the trachea or the cardiac region, or to both at once.

The same rules with respect to medicine and diet may be laid down for persons affected with this complaint, when it occurs in cachectic, chlorotic, or scorbutic habit — in such cases the preparations of iron, with light nutritious diet, gentle exercise in dry wholesome air, &c., have been found peculiarly beneficial. Should the dilatation, after having lasted a considerable time, be at length accompanied with constant dyspnœa, an emphysematous condition of the lungs, difficult expectoration, &c., the use of stimulating expectorants can be adopted—for this purpose ammoniacum, the balsams, decoction of senega, &c., answer best. When dropsical effusions make their appearance in the progress of this affection, and particularly if symptoms of debility are present, such a combination as the infusion of digitalis with vegetable tonics will be found serviceable. Among the more eligible diuretics in some cases, are elaterium, the acetate or bi-tartrate of potash in the decoction of taraxacum, or of spartium scoparium, with compound spirit of juniper, &c.

Paroxysms of dyspnœa, closely resembling those of asthma, are of rather frequent occurrence in this affection. In such cases immersion of the extremities in heated water, the surface of the body being at the same time kept warm by means of a blanket, and the cutaneous perspiration also encouraged—fresh air, however, being admitted—will be found to afford relief. To these means should be added an antispasmodic draught containing camphor, musk, ether, ammonia, or tincture of opium. During such attacks, warm tea or coffee will be found a useful adjuvant. Blood-letting, which is of such questionable application in the majority of cardiac diseases, is, in the present case, decidedly perilous. I have known fatal collapse to ensue from its employment. If it is ever to be tolerated in consequence of the supervention of any inflammation, the abstraction of blood should be merely local. Once again I would impress the indispensable necessity for quietude, both moral and physical, as far at least as may be consistent with the patient's taking gentle exercise.

Before dismissing the subject of dilatation, I think it right briefly to advert to a variety of this affection, which has been called *partial dilatation*, or *aneurysm* of the heart. In this, the enlargement is restricted to a single portion of a cardiac cavity, where an aneurysmal pouch is formed, in consequence either of a dilatation of all the structures of the heart, or an ulceration or laceration of one or more of them at the place of the lesion. Aneurysm of the heart is confined to its arterial half: it has been met with in the left auricle; but the left ventricle is its ordinary seat, and more usually near the apex of the organ than elsewhere. The enlargement is often found filled with successive fibrinous layers, having a solidity in proportion to the priority of their deposition. The endocardium is obviously denser and more opaque, and at an advanced stage of the disease it is seen to be encrusted with cartilaginous or bony patches. The muscular layer is pale and attenuated; and the pericardium is clouded, and mottled with grey and dark spots. Several eminent pathologists, including Kreysig, Zannini, and Laennec, have ascribed the disease to ulceration of the lining membrane of the heart, but I am satisfied that this is not so frequently present as has been supposed. Among the exciting causes of aneurysm of the heart, have been classed fevers, scurvy, rheumatism, the debilitating effects of excesses of any kind; to which may be added, external violence, strong fits of passion, and laborious muscular efforts. It is quite conceivable that professions demanding an inordinate display of whatever calls forth increased action of the organs of circulation may have a tendency to produce this disease; at all events, a lesion of this kind, exhibited in the heart of the celebrated French actor, Talma, was attributed to a cause of this description. The *symptoms* are by no means very marked until the disease has made considerable progress, when a tendency to syncope, palpitations, dyspnœa, and a feeling of uneasiness in the præcordial region are generally found to exist. For precise diagnosis such symptoms are wholly insufficient, inasmuch as they are common to other diseases of the heart.

The *prognosis* in this affection, should its existence be ascertained, is decidedly very unfavourable. The disease most generally terminates by hæmorrhage into the pericardium. M. Breschet, in his Memoir on Partial Dilatation, considers rupture of the aneurysmal tumour as the only known termination of this disease. Numerous cases, however, have been published which tend to prove that the depositions of the fibrinous layers which may be very adherent to the parietes of the sac, as also the thickening of the coats, are so many obstacles which may prevent rupture. With more reason might obliteration of the sac by fibrinous coagula be admitted as a probable termination, especially when the communication established between the normal and the accidental cavity is narrow.

In the *treatment*, we must carefully enjoin the avoidance of everything stimulating, both physical and moral; a modified antiphlogistic plan should also be adopted. For further information see under the head of Dilatation.

ANEURYSM OF THE AORTA.

This disease deserves a short notice here, as it is occasionally mistaken for dilatation of the heart, and frequently produces much disturbance of the respiratory function, by pressure on the trachea and bronchi. It consists in an enlargement of the aorta, which may present itself under four different forms; viz.—*dilatation* of the entire calibre of the vessel,—*true aneurysm*, a sacculated dilatation of only one portion of its circumference,—*false aneurysm*, in which the middle and internal coats of the artery are ruptured, and the external one projects in the form of a pouch—and *mixed aneurysm*, an union of two of the foregoing kinds, as when a rupture of the two inner tunics of the aorta has supervened upon the partial or entire dilatation of all its coats.

The aneurysms of the ascending portion and arch of the aorta, which we have chiefly to consider here, are in their commencement almost always of the true kind, for at the root of the aorta, in consequence of the non-investment of the vessel in that place by a cellular layer, no false aneurysm can in fact occur. But eventually, in any part of the aorta beyond its origin, the true usually becomes converted into mixed aneurysm, and the tumour has been known to extend until it has attained a size considerably greater than that of the heart itself. So great an advance of the malady is rare, but it is not uncommon to find the aorta, especially in its arch, considerably dilated, and opposing a serious obstacle to the due performance of the functions of the lungs and heart.

Causes.—The immediate cause of simple dilatation or of true aneurysm of a vessel is to be sought for in a morbid change in the vital properties of its membranes. Flaccidity and a want of proper elasticity in the middle coat, calcareous incrustations, tuberculous or atheromatous deposits, abscesses, fungous or other tumours between the two inner tunics, appear generally to be precursors of an aneurysmal enlargement. An artery shielded from external injury, as are nearly all those within the trunk, is not, while it continues healthy, liable to have its tunics ruptured or permanently dilated by violence of any ordinary kind, or by the impulse of the column of blood forced into it from the heart. Dr. Hope says decisively that rupture does not appear ever to happen in a perfectly sound artery; and my own experience, which has been extensive, renders me confident that this event does not ordinarily take place except coincidentally with a strumous habit and the existence of tubercular deposit in the lungs. The atheromatous matters and calcareous incrustations which authors have uniformly referred to as existing on the face of the arterial lining membrane in cases of aneurysm, appear to me to be no other than the tuberculous and calcareous deposits which exhibit themselves in other parts of the system at different periods during the course of strumous disease. The altered condition thus manifested in portions of the arterial structure will readily account both for the dilatation and subsequent rupture with which they are affected.

Signs and Effects.—It is obvious that any enlargement of the thoracic aorta, whether an aneurysm or a simple dilatation, and however small in degree, must, commensurately with its size, cause a displacement of some portion of the contents of the chest. An analogous enlargement of the aorta in the abdomen is less liable to produce inconvenience, both because the walls of that cavity are more yielding, and its viscera are less apt, by reason of pressure, to be interfered with in the performance of their functions. The especial character of the lungs and trachea, and the paramount necessity there is for a due ingress and egress of air through them, expose those organs to suffer much inconvenience from whatever may subject them to compression. This, and the peculiarities of the thorax as a bony case incapable of expanding beyond a certain extent to accommodate its contents, ought naturally to prepare us to anticipate a far greater amount of distress from aneurysm in the chest than in the abdomen, and we might, perhaps, *a priori*, have expected that we should have been enabled to discover with certainty the existence of the disease from the symptoms presented. Such, however, is not by any means uniformly the case. Palpitations, dyspnœa more or less intense, difficult deglutition, cough, syncope, startings from sleep, frightful dreams, hæmoptysis, alteration of the countenance, congestions in the brain and the abdominal viscera, serous effusions, hoarseness or loss of voice, sharp or boring pains, unusual fulness of some of the superficial veins, have all in turn been enumerated as symptoms; but each and all may attend other diseases, and not one can be considered a characteristic sign of this lesion. Laennec remarks that the only symptoms common to all aneurysms of the (thoracic) aorta are the oppression, and sometimes a sensible difference in the pulse of each arm; the latter chiefly occurs when the tumour presses on the left subclavian or the brachio-cephalic artery. Bertin and other authorities distinctly state that there is but one certain and unequivocal mark of aneurysm of the aorta; viz. a tumour presenting itself externally, and offering an expansive as well as heaving pulsation synchronous with the action of the heart. Some important indications are certainly derived from auscultation: among these are a purring tremor above the clavicles, a bellows-sound, wheezing or sibilous respiration, and sometimes a pulsation distinct in character from that of the heart in being single instead of double. It has been averred, that, even where the pulsations are double, they are distinguishable by the following circumstances from those of the heart. The first aneurysmal sound (which coincides with the pulse) is always louder than the healthy ventricular sound, and decreases in power progressively on approaching the heart; while the second sound (coincident with the diastole) is perceived to increase in loudness in proportion to the heart's proximity. A special peculiarity, also, attending aneurysmal pulsation is stated to be a deep, hoarse sound, differing from the bellows-murmurs sometimes heard in the heart by being louder, shorter, more abrupt, and like the rasping of a thin hard board heard at a distance. Other indications have been laid down, some of which, in combination with symptoms previously mentioned, may suffice to establish an opinion as to the nature of the complaint; although most, if not all, of them may be present in other affections. There are, in fact, few occasions which call forth so eminently the tact and acute discrimination of the medical practitioner as the diagnosis of aneurysm of the aorta and other arteries of the trunk, so long as they do not approach the surface of the body.

These arterial lesions may be spontaneously cured by the deposition, as in some cases of aneurysm of the heart, of successive fibrinous flakes derived from the blood. The vital fluid, while it remains in the sac, is sometimes partially, if not wholly, removed out of the great current of the circulation, and the agglomeration of its fibrine is thereby favoured,—a circumstance far more common in false than in true aneurysm. The impulse of the circulation on the pliable wall of the tumour becomes, in consequence of the deposit, partly neutralized; the sac contracts, and it may in the end be converted into an impermeable fleshy enlargement. But this process usually takes place only when aneurysm affects arteries of minor size; in the aorta, and especially when there is true aneurysm of that vessel, its occurrence is very rare—the coagulation of blood being almost impossible so near to the centre of the circulation. Generally speaking, we are hardly ever justified in entertaining any other opinion, in the case of an aortic aneurysm, than that as the vascular sac progresses in size, its walls will be at length still further attenuated; that the true will become converted into a mixed aneurysm; and that, eventually, the patient will die of a sudden rupture, and a discharge of the contents of the vessel into the pleura, pericardium, or bronchial ramifications, producing either irremediable syncope or speedy suffocation.

Treatment.—The practice which has been commonly relied on, in aneurysm of the aorta, is of a rigorous anti-phlogistic nature, comprising every available means for diminishing the actual mass of the blood. Albertini and Valsalva were accustomed to reduce their patients, by repeated bleedings and starvation, to a state of such depression, that they could scarcely move a limb in bed; and it is gravely asserted, that this severe method of treatment has succeeded in effecting a cure. It should not, however, be forgotten, that extensive depletion, while it diminishes the quantity and force of the circulating fluid, also alters its composition in a remarkable degree, rendering it far less capable of effecting a cure by spontaneous coagulation. A principle recommended in this country is, to produce at first a prompt impression on the system by means of an abstraction of blood, to the amount of from fifteen to twenty-five ounces, drawn slowly, and while the patient is in a recumbent position—the bleeding by no means to be continued to the supervention of syncope. Within twelve hours a second abstraction of blood to ten or fifteen ounces has been made; and from six to eight ounces more have been subsequently taken away every six or eight hours, or at intervals so regulated as to prevent the establishment of reaction! A plan of treatment much less active would prove more suitable in the majority of cases, for in many instances the disease supervenes on a state of prolonged ill-health.

Low diet, without the large abstractions of blood above mentioned, will soon lower the force of the circulation, and save the patient the injurious effects that too frequently result from extensive bleedings. Everything that tends to quicken the circulation must be avoided: the strictest quietude, both bodily and mental, is to be enjoined. The application of leeches immediately over the tumour when it approaches the surface might be hardly judicious, but we may generally venture to apply them to its vicinity with the intention of relieving pain: there are, indeed, few cases which would not be benefitted by placing them over the region of the heart, or on the trachea—in the former situation they contribute to quiet the circulation; in the latter, to relieve any difficulty of breathing. Saline laxatives, from their known tendency to prevent plethora, are appropriately administered in lieu of more potent cathartics. Tartar-emetic may be prescribed in doses sufficient to control the force of the heart and arteries; and it may at times be replaced by digitalis, the use of which is always to be suspended when it is found to disagree with the system. Camphor, musk, valerian, hyoscyamus, compound sulphuric ether, and various other remedies of a sedative and antispasmodic nature, are occasionally useful. The acetate of lead has, on the continent, been frequently employed in aneurysm of the aorta: a grain or more, with half that quantity of opium, may be administered three or four times a day. It will, very probably, be found necessary to discontinue this medicament after four or five days, on account of its liability to produce colic; but we may then, instead of it, give the infusion of rhatany, alum in the compound infusion of roses, &c. Cold applications to the tumour will often prove serviceable.

By such means we may contrive, for a time, to hold aortic aneurysm in check, and haply aid nature to effect a cure, when such is within the limit of her power: but, unless a progressive and obvious diminution in the volume of the tumour take place, our prognosis should always be of the most guarded description. The hope of recovery, in nearly all instances, is remote: still, by judicious treatment, life may be protracted for a considerable period; and it is our duty not to abandon all expectation of the patient's amendment, as extraordinary instances are on record of a complete subsidence of the disease.

ALTERATIONS IN THE CONSISTENCE, COLOUR, ETC., OF THE HEART.

The heart is subject to several affections of a much more obscure nature than some which I have already described; such are induration, flaccidity, softening, fatty degeneration, &c. *Induration* of the heart, as a result of inflammation, has been already alluded to; it frequently follows hypertrophy, and occasionally proceeds to such an extent that a portion of the heart is converted into a cartilaginous or even horny substance. Both Corvisart and Laennec have, in fact, witnessed instances of this change; and I myself saw, not long ago, a case of considerable induration of the right ventricle, with an almost stony consistence of the fat deposited around it, in a woman who died of apoplexy. Bertin has several times remarked induration in one portion of a heart, other parts of which were softened.

Softening of the heart is a much more frequent pathological condition of that organ than induration. When the tissue of the heart is in a state of softening, it becomes flaccid, and flattened. Its ventricles when cut into collapse, even though hypertrophied, and its substance is very readily torn; mere pressure with the fingers is sufficient sometimes to break it down. Authors have recognised several distinct kinds of this morbid change, which they have designated red, greyish, yellowish, and gelatiniform softening. In *red softening* the muscular structure of the part has been found engorged with blood, or, at other times, with what Bouillaud considers to be a mixture of blood and pus; and it is the prevalent opinion that this appearance is the result of previous inflammation. According to Laennec, a species of red softening in which the heart is of a deep violet colour frequently accompanies typhoid and other bad fevers. Bouillaud expresses his belief that the *grey softening* succeeds to red softening in the heart as it does in the lungs; and Corvisart states, that he has, in cases of this morbid change, found the heart's substance very friable, as well as soft and pale. Laennec has described another kind of whitish or pale softening, in which the structure of the heart is not characterised by friability: this species of softening generally accompanies pericarditis, and is seen in no other case. *Yellowish softening*, which in general prevails only partially throughout the heart, has been deemed a result of chronic carditis, and is often met with in individuals who have been the subjects of other organic lesions, or debilitating affections. *Gelatiniform softening*, in which the viscus is converted into a jelly-like substance, is a form of disease more frequently observed in aged persons. Among the symptoms of softening of the heart are enumerated weakness of pulse, dulness of the heart's sounds, long or frequent dyspnœa, a sub-livid or congested countenance, and some other signs common to it and to dilatation, and for which, I refer to what has been said on that subject.

The heart is sometimes the seat of a superabundance of fat, deposited especially around its base and in its grooves : Laennec states that he has in numerous instances seen this in individuals who have died of diseases unconnected with the heart. The fat has been principally accumulated at the junction of the auricles and ventricles, along the course of the coronary arteries, and at the origin of the great vessels. The heart is also occasionally subject to a peculiar *fat-like degeneration*, distinct from the deposition of true fat, and in which the muscular structure undergoes a change into an adipose substance. The pathology of the latter disease has not been fully established, but it appears to be generally admitted that it is not necessarily dependent on previous inflammation.

Sanguineous effusions in the form of petechiæ are sometimes seen on either or both of the surfaces of the heart after death from typhoid fever, scurvy, purpura, &c.; and at other times blood has been found effused into a cavity in the muscular structure of the heart, and constituting what has been called *cardiac apoplexy*. On these affections, or on abscess, tubercle, polypi, or other vegetations, fungus-hæmatodes, cancer, or malformations of the heart, I need not here dwell. In respect of *ruptures of the heart*, it will be sufficient to remark that they may result from violence; but they more commonly happen in consequence of a diseased state of the organ, such as attenuation of its parietes, or softening of its substance, endocarditis, abscess, or ulceration.

ANGINA PECTORIS.

In an early part of the present work I adverted to this affection, and pointed out the characteristic differences between it and asthma, with which there is some danger of confounding it. In by far the greater proportion of cases the disease has been found accompanied with some morbid condition of the heart or its appendages, such as valvular induration, ossification of the coronary arteries, hypertrophy, dilatation of the heart, inordinate deposition of fat around the organ, &c. Some fatal instances are, however, upon record, in which no organic lesion has been detected; and this circumstance has led many physicians, especially those of the French school, to attribute to angina a wholly nervous origin, and to regard the organic disease discovered merely as a complication. There is evidently great interference with the functions of the nervous system in this affection, and some pathologists seem to consider the disease to consist in incomplete paralysis of the heart. Desportes and Jurine suppose that the ramifications of the pneumogastric nerves are those in which the disturbance resides; Laennec, while in some instances he admits this to be probable, believes that when the feeling of oppression is confined to the heart, the cardiac branches of the sympathetic are the seat of the affection; and different authorities consider the phrenic nerves to be those mainly affected. All, however, appear to agree, that, whatever be the exciting cause, the heart and large vessels are in a state of high engorgement during the paroxysm. I have already, in some early pages, detailed the history of two cases to which I may refer the reader.

In the fit, stimulants have been found the most effectual remedies; but, in order to overcome the disease, and avert subsequent attacks, it will be necessary to investigate with the utmost care the pathological condition on which it may depend, and also to attend to the various complications with which it is so frequently associated: thus, very often the stomach and intestines, the liver, or some other viscus, will be found to have their functions impaired; and these it will be necessary to restore to a more healthy condition, before we can expect any permanent alleviation in the cardiac symptoms. Very different modes of treatment may become necessary, according to the organ which may be complicated, and the way in which its functions may be involved. When the stomach and intestines participate in the disturbance, a strict attention to diet, with the employment of antacids and mild aperients, will probably be called for. Where the liver is congested or otherwise affected, the agents adapted for the removal or alleviation of such a state are indicated. Whenever the disease is associated with a defective performance of the uterine functions, the salts of iron, the hip-bath, and other remedies usually employed to effect their restoration, are of course advisable. Should the gouty diathesis prevail, the employment of colchicum, &c. will form an important part of the treatment for the relief of the suffering organ; if plethora be present, as is very often the case, recourse must be had to depletion. Angina pectoris has sometimes been found accompanied with dilatation of, or a want of power in, the heart; and when the latter is manifested, the metallic tonics, quinine, a bracing air, gentle exercise, and, indeed, whatever remedies promise to promote a healthy tone of the heart and of the system at large, are indispensable. Occasionally the affection appears to be connected with flatulence, in which case carminatives are demanded; and these medicinal agents will, indeed, be frequently required in the actual paroxysm, whatever may be its complication. Counter-irritation by blisters or issues, warm-baths, belladonna plasters to the scrobiculus cordis, and other topical sedative applications, have been used with various success; and Laennec believed that he had sometimes procured relief for the patient by placing magnetized steel plates on the front and back of the thorax, and thus maintaining an electric current through the heart. In my own practice, I place more dependence on the occasional application of a few leeches over the region of the heart, with sometimes one or more upon other parts of the chest.

NERVOUS DISEASES OF THE HEART.

THE heart is liable to several affections which are repeatedly seen to be unattended by any appreciable organic change.

One is a species of *neuralgia*, the attacks of which consist in a violent lancinating pain, more confined to the heart itself than the pain in angina pectoris, and further differing from the latter in its paroxysms not being especially excited by emptying the bladder or rectum, or upon any exertion; as in angina also, there is a tendency to periodical recurrence. This complaint is scarcely ever accompanied with any perceptible structural lesion. It most commonly has some mental origin, as anxiety or long-continued and profound thinking; though a gouty diathesis, errors in diet, an abuse of stimulants, and in particular the employment of very strong tea as a beverage, are also accused of having been at times the *fons et origo mali.* The treatment of this, as of the affection last mentioned, varies considerably according to circumstances; but, in general, a subsidence or discontinuance of the causes which have been instrumental in its production, will be speedily followed by a diminution in the violence of the attacks, or by their entire disappearance. Tonic medicines and mercurials appear to be more frequently admissible in this than in the last-mentioned affection.

Palpitations of the heart may result from numerous and widely differing causes, and in two diametrically opposite states of the system, viz. in plethora and anæmia. The passions of the mind, whether of an elevating or a depressing nature, gusts of anger, excesses of all kinds, dyspepsia, sympathetic irritation of other organs, rheumatism, the employment of digitalis and certain other drugs, the use of alcoholic fluids to any extent, and frequently that of strong tea or coffee, are among the principal causes of inordinate action in the central organ. Whatsoever either permanently or temporarily embarrasses the circulation in the lungs is an excitant of palpitations of the heart, which, however, must be carefully distinguished from those symptomatic of pericarditis, endocarditis, or other inflammatory diseases. Palpitations often attend chorea, and convalescence from fevers; and they are a symptom both of mercurial erethism and of chlorosis: in the latter case they are characteristically attended for the most part with a bellows-sound and a purring thrill in the large vessels. The heart is often disturbed in its function by the impaction of fæces in the large intestine, which, when the portion between the transverse colon and the sigmoid flexure becomes distended, is apt to induce palpitations and other symptoms by the pressure occasioned on the diaphragm and viscera of the thorax. It demands no small amount of judgment on the part of the physician to distinguish between palpitations purely nervous, and those which are either thus sympathetically produced, or are symptomatic of organic disease. Laennec and Bouillaud have pointed out some marked signs indicative of the nervous character of the palpitations. The former writer states, that, in nervous palpitation, the sounds of the heart, though clear, are not loud,—that the impulse of the organ is weak, and its pulse unusually sharp and jerking. Bouillaud asserts that venous congestion, livid countenance, and dropsy, are never complications of palpitations solely nervous. Other authorities have less confidence in these characters: it remains only for me to remark, that the heart is by no means the only organ of the body, the structural disease of which is not always readily distinguishable from its functional disturbance.

Spasm has been enumerated among cardiac affections; but Bouillaud denies that pure spasm of the heart has ever been proved to occur. *Syncope* may, with equal propriety, be considered as a lapse in the normal functions of the nervous system, not as an error primarily seated in the centre of the circulation. The medicinal remedies required in either of these circumstances will commonly be stimulants, and particularly those of a diffusible kind, except perhaps when contra-indicated by the syncope being, as sometimes happens, the result of a plethoric condition.

It appears to be a pathological law, that organs of a like structure are often consentaneously affected by a morbid action primarily set up in some one organ of the class. The hollow muscles of the body,—the heart, stomach, uterus, &c.,—furnished with nervous power from kindred sources, and having their nerves distributed to them in a very analogous manner, sympathize most promptly when any of them becomes in any way the subject of morbid or other impressions. The function of the heart, as also that of the stomach, is especially apt to be sympathetically disturbed in hysteria, its aberrations varying with all the variations of that Protean disease. To treat here separately of hysteric affections of the heart would lead us too far from the main object of this work; hysteria, in connexion with asthma, will, however, receive consideration. Diseases of the heart have already occupied a considerable space in these pages; the reason of which has been, the intimate connexion between this organ and the lungs, and the serious and important effects produced on the functions of the latter viscera by any derangement in the functions or structure of the former. Every organic disease of the heart or thoracic aorta is productive of some additional pressure upon the pulmonary parenchyma and air-tubes, and is capable, if not of directly occasioning the supervention of asthma, certainly of producing a state of the thoracic viscera, the physiological effects of which are equally adverse with asthma to the existence or advance of tubercular phthisis.

DISEASES OF THE VALVES OF THE HEART.

THE valves of the heart are liable to various alterations in their substance, from induration, the deposition of cartilaginous or calcareous matters, fibrinous or warty growths, adhesion of their free borders to each other or to the lining membrane of the heart, &c., all which changes tend in general to produce a diminution in the size of the orifices to which they belong. These morbid lesions are usually the results of endocarditis, and they have been so considered in all cases by Bouillaud, Legroux, and others, but, in my opinion, erroneously. Laennec, however, denies such to be their constant origin, and Monneret seems disinclined to consider ossification of the cardiac valves as a morbid process in every case, but regards it in many instances as an exemplification of the law according to which the several tissues of the body become indurated with the progress of age.

Excrescences, induration, ossification, adhesions of the valves, &c., are of much more frequent occurrence in the left than in the right cavities of the heart. According to M. Bizot, in one hundred and fifty-six cases of valvular disease, the valves of the pulmonic side of the heart were found altered in only two instances; and some recent researches in our own country have established, that, in nine-tenths of the cases of valvular alteration, the disease occurs in the left or systemic portion of the organ. This great preponderance has been supposed to be due to the arterial possessing a more stimulating quality than the venous blood ; and certainly in support of this opinion comes the fact that many cases of valvular disease in the right side of the heart have been attended with patency of the foramen ovale, through which a portion of the arterial current would be forced into the right auricle. The semi-lunar valves at the entrance of the aorta are those most frequently diseased, and next to them the mitral valve. On the right side of the heart the order of frequency is reversed; there the tricuspid or auriculo-ventricular valve is that most commonly affected, an alteration of the valves at the origin of the pulmonary artery being an extremely rare occurrence.

The earliest perceptible change in the valves is opacity, with a thickening of substance caused chiefly by hypertrophy of the fibrous tissue. This alteration is not always to be considered morbid, but in general as the ordinary result of years. An organ which, like the heart, is throughout life in perpetual activity might be justly expected to undergo a greater number of physiological changes than portions of the body less constantly exerted. The opacity above mentioned is, however, often followed by cartilaginous induration, which has its seat commonly between the fibrous and the inner membranes of the valves, but occasionally in the fibrous tissue itself. More frequently the valves are the recipients of ossific, or rather calcareous, deposits, the precursors of which are yellowish spots constituting the nidus in which the adventitious substances are afterwards deposited. M. Bizot states he has met with such spots only on the semi-lunar and mitral valves: in them yellow rounded corpuscles subsequently appear, each having in its centre a calcareous nucleus ; and these hardened points increase and agglomerate into an ossific mass of greater or less extent. Both cartilaginous induration and ossification are most common at the base of the valves and at their free edges; it is only in aggravated cases that the entire substance of a valve becomes rigid. In some instances, however, the valves have been found so completely consolidated by a union near their borders as to exhibit the appearance of a tube somewhat resembling a shell; and in other cases they have so far united, as to constitute a bony septum, leaving merely a slit for the transmission of the circulating fluid.

The general symptoms of diseases of the valves of the heart and its appendages comprise dyspnœa, with frequently an urgent desire for fresh air as in asthma, cough, abundant expectoration, with occasional hæmoptysis, pulmonary congestion and œdema, turgescence of the jugulars, and engorgement of the whole venous system, and ultimately general dropsy.

A narrowing of the aortic orifice is attended with a superficial whistling or buzzing, which obscures the first sound of the heart; and a pulse, small, hard, and thrilling under the finger, which latter sign is pathognomonic of this lesion. *Insufficiency of the semilunar valves* is distinguished particularly by an obvious pulsation in the arteries of the neck and upper extremities, with a bellows' sound in the ascending aorta, carotids and subclavians, during their diastole, a hard pulse, and prolonged interval between the contraction of the heart and the pulse in arteries distant from the centre of the circulation. *Narrowing of the left auriculo-ventricular opening* is denoted by a bellows' murmur associated with the second sound of the heart, and heard most distinctly at the left margin of the sternum between the third and fourth ribs. *Insufficiency of the mitral valve* is indicated by a murmur audible during the first sound of the heart, and by a strong action of that organ being accompanied with a feeble and irregular pulse. *Narrowing of the right auriculo-ventricular orifice* will be attended, one would suppose, with sounds similar to those distinguished in coarctation of the corresponding orifice on the left side of the heart, but loudest a little to the right of the mesian line. Other signs are, that the arterial pulse is much less interfered with in this lesion than in one affecting the left auriculo-ventricular opening; and that the venous pulse alternates with that in the arteries and the ventricular systole. *Insufficiency of the tricuspid valve* is marked by a bellows' sound replacing the first sound of the heart, and the distension of the jugular and other veins co-incidently with the ventricular systole and the arterial pulse. *Narrowing of the pulmonary orifice* will indirectly render the arterial circulation low and feeble, by the impediment which it interposes to the due aëration of the blood in the lungs: a bellows' sound or purring thrill heard over the origin of the pulmonary artery, and a reflux perceptible in the jugulars are additional signs of this lesion. *Insufficiency of the pulmonary valves* may be characterised by a venous pulse and turgescence of the veins, but it is of extremely rare occurrence. Finally, *in disease of the semilunar valves of the aorta*, (as in narrowing of the aortic orifice,) a superficial hissing or whizzing sound is heard, which is most distinct at the middle of the sternum, and associated with the first sound of the heart when it is connected with the normal current, and with the second when depending on regurgitation. An important indication of disease affecting the valves at the commencement of the great arteries, is that the peculiar sounds heard are propagated most distinctly along the course of those vessels, while in disease of the auriculo-ventricular openings they are more especially confined to the cardiac region. It is worthy of especial notice, that the complete disorganization of a cardiac valve is often attended with sounds less characteristic than those which accompany a less extensive lesion; and that the difficulty of diagnosis is often augmented by the co-existence of different species of disease, such as insufficiency of a valve with coarctation of its corresponding orifice, &c. Bellows' murmurs and other sounds may be present without organic disease of the valves or orifices; but those originating in hysteria or other nervous affections are distinguished by being intermittent; those accompanying dilatation of a ventricle are diminished by whatever quiets the action of the heart; and the sounds in actual disease of the valves are stated to have always a rasping character. *Progress of the disease.*—This will be much influenced by the exciting causes of the affection. Should there be acute inflammation of the lining membrane of the heart, the several symptoms indicating the presence of the disease will not be slow in appearing, whilst, in the case of chronic inflammation, the complaint may be protracted. When once valvular disease commences, its progress is, in general, continued and uninterrupted. *Complications*—The principal of these is hypertrophy—the mode of its production is entirely mechanical, and may be readily understood—dilatation is also one of the not infrequent complications of this lesion. This influence exercised by narrowing of the orifices or by valvular insufficiency is more marked in causing hypertrophy and dilatation of the left cavities. The other complications of valvular disease are pulmonary emphysema, occasional hæmoptysis, and congestion of the bronchial mucous membrane. The prognosis is invariably unfavourable, though the duration may be protracted to an indefinite period by judicious management.

When any extensive alteration of the cardiac orifices or valves has been produced, we can only expect that the patient will in the end succumb to a sudden disturbance of the circulation, or to dropsy or other constitutional effects of the organic disease. But by appropriate treatment we may prolong life, and in no small degree alleviate the distressing effects of the congestion which is present in all valvular diseases of the heart. Venesection may be repeated at intervals, according to circumstances, and its employment is indispensable on the occurrence of a violent paroxysm of dyspnœa. In cases marked by hypertrophy, digitalis and hydro-sulphate of ammonia, in rather limited doses have had their advocates; though perfect repose and a careful attention to diet will in general prove more manageable, if not more efficient means, for quelling a too powerful action of the ventricles. Tartar emetic, ipecacuan, squill, nitre, &c., and other remedies of this class are sometimes made use of to combat œdema: bitter tonics and chalybeates have, however, proved more useful remedies for this purpose, when a plethoric condition of the patient has not contra-indicated their employment. The application of leeches to the thorax, especially over the region of the heart and the left lung—where the most severe pressure from congestion is commonly experienced—will, in general, be found more suitable for removing dyspnœa than periodic bleedings; and it is often desirable that one or two leeches should be placed above the summit of the sternum to relieve both obstruction to the respiration, and irritation of the trachea. The employment of the inhaling-tube I have also found very beneficial in cases of valvular disease, as, by regulating the expiratory efforts, it tends to remove the inconvenience which the engorged heart and vessels of the chest suffer in a too voluminous condition of the lungs.

The valves and the lining membrane of the heart are frequently the seat of warts and other vegetations. The warty growths are fibro-cartilaginous, and of very variable figure—fusiform, flattened, cauliflower shaped, &c., more common on the arterial valves than elsewhere. Fibrinous and albuminous growths, or cysts, filled with a clot or concrete fluid are often found adhering by long pedicles to the same surfaces as the warty excrescences, and by some authorities they have been considered the result of inflammation; though the warty vegetations have not uniformly been so regarded.

DISPLACEMENT OF THE HEART.

The heart may be turned from its natural place by a variety of causes, such as effusion of fluid into the sac of the pleura (hydrothorax, &c.) which may have the effect of pushing the heart to the right side of the sternum, or, on the contrary, may force it more than natural to the left. An emphysematous condition of the lung may occasion similar displacement, the direction of which will of course depend on the portion of the lung affected. Aneurysmal enlargement of the aorta will produce the same effect; any circumstance, in fact, which is capable of destroying that equality of pressure made in every direction by the lungs, and through which the heart, under ordinary circumstances, is retained *in situ*. Hypertrophy may have the effect of causing slight displacement of the organ, by tilting the apex to the left and the auricles to the right. Dilatation, when considerable, may also lead to displacement. Abscesses in the mediastinum, deviations of the vertebral column, malformation of the sternum, an escape of any of the abdominal viscera into one side of the chest through an aperture of the diaphragm—tumors in the abdomen, as enlargement of the liver, especially of the left lobe, ascites, &c., may obviously produce the same effect. Among the means of detecting the existence of displacement, percussion holds a prominent rank; though if the displacement were caused by an effusion into the pleura, it would not be so very easy to form a certain diagnosis without the additional aid of auscultation. It should be borne in mind that displacement of the heart may be congenital. I myself saw a subject while attending the lectures of Beclard in Paris, in which the heart was found on the right side. I have indeed met with not less than three instances of this phenomenon.

Symptoms.—Among the chief of these may be set down interference with the functions of the heart, more especially palpitations, the extent and severity of which will depend on that of the displacement itself. Various other symptoms have been assigned to this cause, the presence of which will depend no doubt on the amount and direction of the displacement,—a difficulty of swallowing with pain along the œsophagus, and at the cardiac orifice of the stomach—disturbed digestion, and sometimes nausea proceeding even to vomiting.

We must not always infer the presence of displacement of the heart from the circumstance of the pulsation of this organ being heard on the right side. It is Riolan, I think, who mentions that the celebrated Catherine de Medicis habitually felt the pulsation of the heart on the right side, without complaining of any inconvenience from the circumstance.

ANOMALOUS FORMATIONS OF THE HEART.

The principal anatomical deviations in the structure of the heart may be enumerated as follows:—Persistence of the foramen ovale, allowing a communication between both auricles: this anomaly is occasionally accompanied by another, viz. a pervious state of the ductus arteriosus. Sometimes a communication exists between the ventricles by a perforation of their septum.

The first is by far the most frequent of the above anomalies. It was once supposed that a bluish colour of the skin of the body was an essential characteristic of these malformations. It has now been proved, however, that such is not the case, and that this strange colour of the skin is not a constant concomitant of them, and that when it is, it is dependent on other causes.

The course of this disease, if I may so call it, is extremely variable; it in general cuts off the patient at a very early period. Some very few, however, have been known to live to forty or fifty years. Any *treatment* to be adopted in such a case is decidedly of a merely palliative nature.

HYDROPERICARDIUM.

Effusion of serum into the pericardial sac may be of an active or passive kind. Such at least is the division of this affection adopted by Bouillaud, though, strictly speaking, it is a division liable to some objections, among others, to that of being arbitrary as well as inadequate. In the active form the effusion is rather the effect of inflammatory action, as of pericarditis, than a primary disease. Its occurrence as an idiopathic affection is extremely rare. When it takes place under the passive form it is the result of some obstruction to the freedom of the circulation, or of a general hydropic diathesis. There is no slight difference of opinion among pathologists with respect to the quantity of effusion necessary to constitute a case of hydropericardium. When this amount exceeds two or three ounces, Bouillaud considers the case to be one of hydropericardium.

Nor are writers agreed with respect to the symptoms and signs of this affection. One of the principal is a sense of enormous weight in the præcordial region. Reimann and Saxonia state that the patient can feel his heart floating in a quantity of liquid. Senac and Corvisart have both *seen* and felt the fluctuations of the effused fluid in the intervals of the third, fourth, and fifth ribs. The other local signs are, prominence of the præcordial region and fulness of the intercostal spaces; diminished resonance on percussion over the cardiac region; the pulsations of the heart audible over an extended space; the beats of the organ are tumultuous, and seem to reach the hand through a soft body. The pulse may be small, frequent, and irregular; according to Senac it is hard and slow. As a point of diagnosis, it may be well to observe that the sounds of the heart are more distinct at the top of the sternum, and over the large vessels at the lower part of the neck, than immediately opposite the heart itself.

Treatment.—The active form of this affection is to be treated on anti-phlogistic principles, viz. bleeding, cathartics, diuretics, &c. When no other hope remains, relief by surgical operation has been attempted. Such a measure, it is scarcely necessary to say, is not by any means to be resorted to when there is any organic alteration of the heart.

INFANTILE, OR THYMIC ASTHMA.

Laryngismus stridulus.

There is a form of asthma affecting children about the period of dentition, which only of late years has been recognized as a distinct variety. The names by which it is designated are many, and considerable confusion has been thereby occasioned. Some give it the name of *spurious croup;* it is more generally called *spasmodic croup*, and there is reason to believe that it is far more common than the genuine croup,—the cynanche trachealis, with which it is even still very frequently confounded. The symptoms, in both the spasmodic and the true forms, bear a close resemblance to each other; but the absence of inflammation, fever, or false membrane in the former, together with its sudden coming on and equally sudden disappearance, constitutes the characteristic distinction between both.

Its mode of attack is ordinarily imperceptible and insidious. The child, asleep, and perhaps in the arms of its nurse, is suddenly awakened with a piping cry; there is, according to the nurse's language, "a catch in the breathing"—inspiration appears entirely at a stand for a time. The moment when it returns is marked by a peculiar crowing sound, simulating that of croup; the eyes stare, or assume a glassy appearance; the countenance becomes somewhat flushed, or even sublivid, and there are indications of great distress; the head is thrown back, the spine flexed in the same direction; the thumbs and fingers, as also the toes, occasionally become contracted; and the little patient gives a brief low cry. The breathing, the interruption of which is in paroxysms, soon becomes natural. After intervals, which vary from a few seconds to a minute or two, the power of inspiration is gradually restored, the air being drawn in with a whistling or crowing noise, like to that which occurs in hooping-cough. This peculiar sound is produced by the rapid ingress of air through the narrowed glottis: a fit of coughing or acute cries terminate the fit. The state of the pulse, and the temperature of the skin are now normal; the child takes the breast or food greedily; there is no cough whatever, and the patient seems quite well, and in a little time readily falls asleep. As the disease progresses, the attacks, even without any apparent cause, take place several times during the day; they are easily induced by passion, coughing, or an attempt to drink, and often after a full meal. It is worthy of remark that, as the fits become more frequent and prolonged, the convulsions, at first partial, soon affect the entire body.

The following remarks on this perplexing disease, condensed from a late edition of Laennec, and originally derived from Professor Andral, are really deserving of attentive perusal. According to this writer German physicians have described a form of disease which has its seat in the thymus gland, by the name of *thymic asthma.* This form of asthma is produced, they say, by hypertrophy of the thymus, and is therefore seen only in childhood. Drs. Kopp and Hirsch assign to it, as a characteristic symptom, an intermittent dyspnœa, during the paroxysms of which there is, as it were, a suspension of the respiration. The accessions, it is said, occur under three principal circumstances, viz:—when the children begin to cry; whilst swallowing their food; or on awakening from sleep. Thymic asthma may attack children from the age of three weeks to that of eighteen months; from four to ten months is the usual age for its commencement. After an indefinite period it may terminate fatally, or end in recovery. In the latter case, the fits diminish gradually in frequency and severity, and about the age of four years they disappear entirely. On the accession the children suddenly cease to breathe; they seem no longer able to admit the air through the glottis, which is spasmodically closed. In less severe cases, the air is admitted, but incompletely and convulsively; each inspiration, which is whistling and short, is accompanied by a piercing cry, which is a characteristic sign. During the fit also, all the phenomena of asphyxia, dependent on a greater or less suspension of the breath, are observed—in the intermissions the health is good. During the paroxysm the little patients often die, more especially when epileptic symptoms supervene. On post-mortem examination, there is observed merely hypertrophy of the thymus compressing the lungs and vessels in its vicinity.

Causes.—Changes in infancy dependent on the growth of the body; the period of dentition; a scrofulous and rickety constitution; gastric and intestinal irritation; enlargement of the thymus gland, by interrupting the circulation through the heart and lungs; spasm of the glottis, the importance of which has been much dwelt on by pathologists of our own country, as well as on the continent, and which is by many considered the disease itself. Some have assigned to it a cerebral origin; others have considered cold as one of the exciting causes of the affection.

Diagnosis.—The distinction between this disease and croup has been already stated. The absence of the peculiar cough, or of cough altogether, establishes the diagnosis between it and hooping-cough; whilst the non-existence of any of the ordinary signs of thoracic disease, will enable us to discriminate it from any other malady of the pulmonary organs.

This complaint may be distinguished from bronchial asthma thus: in the former the temporary asphyxia is complete; whilst, in the latter, it is imperfect. This distinction is obviously founded on the pathological states of the parts of the air-tube immediately concerned; that is, in the one the glottis is absolutely closed, whereas in the other the calibre of the trachea is merely diminished by an approximation of the ends of the rings. In the two varieties we have striking illustrations of what is meant by reflected irritation.

In the second stage of thymic asthma, attended with quick pulse, heat of skin, convulsions, &c., the affection bears not a little resemblance to hydrocephalus. In the infantile asthma, however, the symptoms of the congestive and inflammatory stages of the latter disease are absent, as are also the convulsions, and the paralytic or comatose symptoms;

in the asthma also, on the cessation of the fit, all the functions become re-established.

Prognosis.—This chiefly depends on the exciting or proximate cause. When the complaint is connected with a disordered state of the gastro-intestinal surface accompanying dentition, the prognosis is rather favourable. If the fits are severe, of frequent recurrence, or of long duration, it is decidedly unfavourable for obvious reasons, viz., from the probable supervention of severe asphyxia, or of serious cerebral or pulmonary congestion. When it depends on enlargement of the cervical or bronchial glands, but more especially of the thymus, the danger is always considerable; for the disease may prove fatal before medical treatment can make any impression on its exciting cause. It may be worthy of inquiry why, in cases accompanied with enlarged thymus gland, inflammatory croup is sometimes produced; whilst, at other times, the disease assumes a purely nervous character, as, for instance, in the affection now under consideration.

Pathology.—Dr. J. Clarke, a physician of high character and great experience, would have it that the disease depended on cerebral disturbance. Dr. Ley referred the affection to the influence of enlarged glands, compressing the recurrent nerve or some part of the eighth pair. He, in fact, considers the complaint as connected with paralysis, rather than convulsion. An ingenious view of the pathology of this disease has been proposed by Dr. G. Reid. This practitioner has attempted to prove by experiment that, by the inferior laryngeal nerve all the motions of the larynx are influenced, whilst the superior laryngeal nerve, he argues, is a nerve of sensation. Now, the fact of these nerves being irritated will interfere with the chink of the glottis. Irritation of the former, he says, will produce a closure of it *immediately*; that of the latter will effect the same result *mediately*, viz., by reflexion from the spinal cord. The same principle of reflex action is adduced to explain how this opening will be influenced by irritation of any of the gastric branches of the eighth pair, and is thus made to account anatomically for the occurrence of the spasm after a full meal. In a somewhat similar way an attempt is made to show how exposure of the child's face to a sharp wind, or the nurse's tossing the little patient in her arms, will bring on the spasm. This is supposed to occur under the influence of some of the incident branches of the fifth pair.

Treatment.—In very many cases this disease is entirely overlooked, unless when it assumes a severe form. The patient oftentimes recovers without any particular mode of treatment. This is readily accounted for by recollecting that the affection, for the most part, depends on enlargement of the thymus gland, the natural tendency of which is to diminish gradually.

The first thing to be done during the paroxysm is to sprinkle cold water on the child's face, for the purpose of relieving the spasmodic state. Should the fits be of frequent recurrence, the warm bath will be found serviceable. A laxative enema, containing a few drops of turpentine, may be given with advantage when the disease appears to be connected with intestinal irritation. A case is recorded in which, after repeated attacks complicated with convulsions, a long suspension took place after the employment of a tobacco enema consisting of five grains infused in one ounce of water: this we should be disposed to consider rather hazardous in a child two years old. In order to guard against cerebral congestion, as well as to relieve the gums if under dental irritation, the application of a leech or two on each side of the lower jaw, or behind each ear, may be advised. The practice of incising the gums very freely is recommended by some physicians; but, in my opinion, such a mode of treatment is often attended with no other effect save that of giving unnecessary pain. It is needless to inculcate the expediency of attending to the state of the bowels, and to regulate them, when it may appear necessary, by rhubarb and magnesia, to which now and then may be added small doses of calomel, between which sometimes may be interposed an aperient consisting of castor oil.

The employment of antimonial wine, of the hydriodate of potash, or hydrargyrum cum creta,—the doses to be regulated according to the age of the sufferer and the severity of the disease,—the occasional application of leeches, alternated with small blisters or mild mustard cataplasms to the upper part of the sternum, and assisted by antispasmodics,—hold out the most rational hopes of success in all cases where so much depends on the removal of glandular enlargement.

When the disease seems to incline to the catarrhal variety, I would recommend small doses of the liquor ammoniæ acetatis, ipecacuanha, nitre, preparations of squill, a leech to the trachea, and a counter-irritant to the chest.

After the removal of every appearance of local congestion or inflammation, the use of antispasmodics is indicated. Among the medicines of this class none ranks higher than musk; but, to prove effectual, it should be given in considerable doses: to a child one year old two or three grains at least at a time. It may be exhibited in the form of enema, combined with assafœtida. The preparations of ether or of ammonia have been recommended as beneficial. The other substances sometimes resorted to for their antispasmodic effects, but less efficacious than the former, are conium, hyoscyamus, and belladonna. We know that, in the case of adult asthmatics inhaling the smoke from tobacco, stramonium, and other such substances, often affords relief; may we not then explain the beneficial effects of these narcotics in thymic asthma in a similar way? viz., by their tranquillizing or sedative effects on the morbidly excited state of the nervous system. They however require to be administered with great caution. Roesch considers digitalis as a useful antispasmodic. When the disease seems to consist merely in spasm of the glottis, Hachmann advises the extract of lettuce, combined with oxyde of zinc and small doses of ipecacuan. The diluted hydrocyanic acid may be advantageously tried; from its supposed sedative influence on the true spinal nerves. With the view of restoring the strength of the system in the convalescence from this spasmodic affection, the administration of tonic medicines may be often advisable. The articles of this class considered most applicable to the cases now under consideration are the flowers of zinc, the hydrocyanate of the same metal, the ammonio-sulphate of copper, and the citrate of iron: to these may be added the disulphate of quina. To aid in removing laxity of fibre, and to restore the healthy action of the skin, I would further recommend the cautious and judicious use of the cold bath. At first the water should be tepid, and the temperature gradually lowered from day to day, till at length cold water may be employed without risk. The season of the year must, of course, be taken into account when recourse is had to this important and energetic remedy. From the obvious beneficial effects of change of air in asthma and hooping-cough, the same expedient should be duly resorted to in the disease now in question. The child ought to be brought out when the weather is favourable, care being taken not to expose it to the chilling effects of cold sharp winds ; due attention to its clothing is indispensable. As the disease frequently has its origin in a disordered condition of the digestive organs, so does it leave behind it with equal frequency a state of the same viscera, requiring from the medical attendant close attention to the quality of the food, to the quantity taken at each meal, and the intervals between the meals.

Two extraordinary cases of this form of disease fell under my own observation, occurring at different periods in two children belonging to the same family, under a year old, and still at the breast: the termination was fatal in both cases. At the autopsic examination, there were found vegetations in the ventricles of the larynx, similar to those sometimes observed in the valves of the heart. In another case, which originally assumed this form, I found a tuberculous nodule situate in the upper part of the thymus, and pressing on the trachea. What was remarkable in this instance is, that the disease put on a decided inflammatory character.

HAY-ASTHMA.

We now come to consider a variety of asthma, whose exciting cause is more tangible, if I may so say, and more obvious than that of the other forms of the disease we have already treated of, inasmuch as we can refer to a sensible, material object, the presence of which is known to produce it, and the removal of which is sure to be followed by its subsidence. I here allude to the affection, which has been called by the various denominations of *catarrhus æstivus*, or *summer catarrh*, *hay-fever*, &c. It has only very recently attracted the attention of medical writers—we find no allusion to it in the older authors. I believe the first notice we meet of it is from the pen of our own countryman, Dr. Bostock, who has described the symptoms with which it makes its attack in the Medico-Chirurgical Transactions, he having suffered severely from it for a considerable time.

The disease generally makes its appearance towards the end of May, or beginning of June; its duration is variable, as it depends on a variety of circumstances in the conduct adopted by the patient. It generally terminates about the middle of July.

Symptoms.—These I shall detail in the order of the organs or parts from whence they have their origin:—1st, the patient complains of a sense of uneasiness, heat and itching in the conjunctivæ—the part where the itching is felt to be greatest is in the tarsi and carunculæ lacrymales, in which considerable inflammation is found to exist; the secretion from the Meibomian glands is much increased; the eyes are very watery; the eye-ball itself feels tense and full; there is great intolerance of light:—2nd, an extension of the inflammation to the membrane lining the frontal sinuses is indicated by intense pain and weight of the head anteriorly, which is soon followed by severe sneezing, fever and restlessness—the nostrils become stuffed, the secretion of mucus from the Schneiderian membrane is greatly augmented; the commencing symptoms resemble closely those attending a bad cold in the head; as the disease progresses, the inflammation at length reaches the fauces and trachea, occasioning a feeling of dryness and a sense of pricking in the throat.

These symptoms are soon followed by a feeling of tightness in the chest, and in the more severe attacks, by wheezing, cough, and difficulty of breathing generally without expectoration. Sometimes the respiration becomes so difficult as to threaten suffocation. The symptoms are much aggravated by extraordinary bodily exertion, or by exposure to the sun or open air. Towards night the patient frequently suffers a regular asthmatic paroxysm. In bad cases the wheezing and dyspnœa are observed to be permanent; the eye-lids become œdematous; there is also great inability to move, and to retain the recumbent posture. The duration of the disease is on an average from five to six weeks, and it is often accompanied, as I have said, during its entire course, with febrile symptoms, general indisposition, and some irritability of temper. It is found in some rare cases to leave behind it languor and debility, with a dropsical state of the feet and ankles.

From the above detail of the symptoms, I feel myself warranted in considering this disease to be a form of spasmodic asthma, to which are super-added the symptoms of intense irritation of the mucous membrane of the eyes, and of the membrane lining the air-passages, more especially their upper portion. I myself have met with a case in the person of the son of a member of parliament, where the nasal secretion was so acrid, as to produce excoriation and tumefaction of the lower part of the nose and of the upper lip.

From what is known regarding the exciting causes of common asthma and frequently of dyspnœa, they may be considered as exerting their primary influence on the nervous system, and thereby producing suddenly their several effects. We know, for instance, that several asthmatics have the paroxysms of their disease brought on by the impression of light or darkness: others will be similarly affected by certain odours, as those of the tube-rose, of the sun-flower, or stored apples; also by certain electrical states of the atmosphere. I myself have seen a person who had been employed in the India House, and who was obliged to resign his official situation therein, in consequence of the dyspnœa which he suffered from the odour of the tea, more especially the green tea. The effects of the powdered ipecacuanha in producing the convulsive paroxysms have been already noticed. An asthmatic fit is often brought on by the fumes of the oxydes of lead, the influence of which on the nervous system is known to every one. Indeed, any cause which has a tendency to disturb the nervous power is capable of occasioning spasm of the trachea, with dyspnœa and other symptoms of asthma. When we take these facts into consideration, we need not feel sceptical as to the effluvia from the flowers of grass, the odour of the bean-flower, &c., being the occasional cause of the variety of asthma of which we are now treating.

It may be well to observe, that this disease does not attack indiscriminately all persons exposed to its influence; it is only some individuals, and those not ordinarily subject to catarrhal affections, that are assailed; and this occurs, as we have already stated, at a certain period of the year, namely, in May or June; and these persons, by avoiding the vicinity of hay-making and hay-stacks, may escape the complaint altogether.

We have an account of a lady who was subject to this affection for many seasons, and who was, in consequence, in the habit of retiring to Harwich or some other part of the sea-coast, more especially selecting such districts as were barren of grass. On one occasion this person, whilst walking on the shore, had an attack of her old complaint, and that without any apparent cause; it was soon ascertained, however, that hay-making was going on upon a cliff beneath which she happened to be walking at the time the fit occurred. This same lady was affected with sneezing, catarrhal symptoms and dyspnœa, in consequence of her children who had been playing in a hay-field coming into the room in which she was. On another occasion also when at Cromer, after her disease had entirely disappeared, and all the hay-making in the country around was completely finished, she was attacked suddenly with the symptoms of this affection; on going up to her bed-room, she saw from the window a hay-stack being made up, the hay having been brought from a distance of several miles.

When packing baskets with hay, this individual found her breathing so severely affected, that she considered the seeds of the grass actually poisonous to her.

The hereditary nature of this affection is strongly illustrated in this person. Her uncle and his son laboured under the disease simultaneously with herself —she states that she is perfectly exempt from every symptom of asthma at every other season of the year.

In another case of this disease, which I have met recorded, the cause as well as the mode of treatment are presented in so striking a manner, that I cannot refrain from giving a brief abstract of it: the person affected was the wife of a stable-keeper in the West-end, who, when questioned by her medical attendant, complained of what she was pleased to term "a crying cold:" viz., watery eyes, sneezing, and discharge from the nostrils, difficulty of breathing accompanied with a wheezing; there was also some pain in the site of the frontal sinus. These symptoms had come on suddenly a few days previous to the visit of the medical man. On their first appearance her husband determined on driving her in his gig a little way into the country for the purpose of consulting a medical friend of his as to the nature of the case. When on their way the symptoms left her entirely, and she at once became perfectly free from all her ailments. She remained for two or three nights in the city in the enjoyment of good health, and then returned home, when all the annoyance of her malady quickly reappeared. The remedies usually employed in the treatment of catarrhal affections were all tried to no purpose. The medical attendant, finding a strong smell of new hay through the house, began to suspect the cause of all the mischief, and had her removed to another residence not more than one hundred yards distant from her former habitation, upon which all her catarrhal and dyspnœic symptoms disappeared at once. In this case the lofts of the house were filled with new hay, which emitted a very strong odour. The correctness of the opinion with respect to the real cause in this instance was confirmed by the fact, that the patient was always worse at night, when the house was closed, and felt much relieved in the morning on the admission of a free circulation of air through the open windows.

Nothing can point out more satisfactorily both the cause of this affection, and the only effectual mode of treatment to be adopted for its removal.

In further proof of the fact that this disease is hereditary, I shall cite the case of a lady, the mother of a large family, who was subject to this disease periodically, and for several years, presenting the symptoms already enumerated, and in rather an aggravated form. The complaint always commenced with her when the grass came into flower; and when the flowering time was over, she could go into a hay field with perfect impunity.

Three of the sons of this lady are subject to attacks of this affection, similar to hers, only less severe. One of these young men had the disease at Geneva, whilst another of them was attacked with asthmatic symptoms from being exposed to the smell of guinea-pigs. Cases are recorded, from unquestionable authority, wherein the odour arising from different animals affect some persons in a most unaccountable manner: the animals producing these strange effects, are the calf, hare, and guinea-pig as above mentioned.

Treatment.—The line of conduct to be pursued in the management of this disease, must be obvious from what we have now said with respect to its immediate and exciting cause. Instant removal from the place where hay is making or flowering, should be strongly recommended. The prudence of this step is well exemplified in one of our dukes, who retires every year to Brighton, for the purpose of avoiding the affection. Some of our members of parliament, also, are known to resort to the same place, and with the same view. As removing from home, however, may not be always convenient to the sufferer from this complaint, it may be well deserving our notice to inquire whether there are any measures, whether hygienic or medicinal, from which benefit may be derived in this truly obstinate and intractable affection. A medical writer, who conceives that its principal exciting cause is the exhalation of the sweet-scented grass (*anthoxanthum odoratum)*, suggests the employment of the tincture of the lobelia inflata, from which he seems to have derived more speedy and effectual assistance in the removal of the disease than from any other means. With respect to prophylactic treatment, the cold shower-bath has been strongly urged. A combination of the di-sulphate of quina, and sulphate of iron, has also been found successful in perfectly curing persons who had been periodically subject to a return of it for several years.

Analogy has led to the employment of the chlorides (as of lime or soda) in this complaint, on the presumption that, because these substances are capable of decomposing, and thereby rendering harmless certain poisonous *animal* effluvia, they may have a similar effect with those of a *vegetable* nature. This remedy has been found successful in relieving three persons out of four; but whether it produces its good effects by neutralizing the exhalations, or by diminishing the sensibility of the mucous and cutaneous surface, it is not easy to determine: about the modus operandi, however, it is not worth while to quarrel, provided the measure proves effectual. The mode of employing the chlorides in the treatment of this affection, is to promote the escape of the chlorine by placing it in flat vessels about the bed-room, and by hanging up around the several rooms rags dipped in the solution; the patient also should carry about with him a bottle of it, which he is to smell occasionally; he ought also to wash his face and hands in it night and morning. In case the pain in the site of the frontal sinuses should be troublesome, a leech applied to this part may be found advantageous; where there is wheezing, a leech or two to the throat may be recommended. The state of the bowels must also be attended to.

Laennec mentions the instance of a gentleman about forty years of age, not habitually asthmatic, and who, with the exception of being slightly hypochondriacal, enjoyed good health. This person resided in a town situate in an extensive plain: on one occasion he found it necessary to leave home for the purpose of visiting a friend, who resided a few leagues distant from his house. For this purpose he mounted his horse, and proceeded on his journey; but the first sensation occasioned to him by the wide expanse of air now opening on him as he proceeded onwards, was that of great oppression of breathing, which went on gradually increasing. This became at length so severe, accompanied also by a feeling of syncope, that he was induced to return home. On wheeling round his horse for the purpose of doing so, he immediately felt much relieved, entirely recovering his strength. In consequence he again attempted to resume his journey, but the oppression of breathing returned and prevented his proceeding. The moment he wheeled round his horse towards home, he again recovered perfectly. This occurring several times, he ultimately determined on repairing towards home altogether: an attempt has been made, indirectly no doubt, by one of our hospital lecturers on the practice of physic, to set this down as an instance of hay-asthma, and one not understood by Laennec; with how little propriety, the reader may readily judge, after the ample description which I have given of the symptoms of that affection. If I may venture to offer an explanation of the sensations of the person in this case, he was, as we have stated, a hypochondriac; that is, he was in other words, a very sensitive or nervous individual; on turning his back to his own house, and proceeding on the intended journey, the breeze blowing directly in his face oppressed him, as is often the case with nervous persons, and probably gave him, as it were, an idea that his lungs were not capacious enough for the reception of the enormous quantity of air rushing into them through the vastly extended plain; when on making his horse turn in the direction of home, the wind being in his back, this sense of oppression ceased altogether. The attempt to establish any likeness between this case and hay-asthma is really futile.

HYSTERIC ASTHMA.

The propriety of considering the disease to which I give the name of *hysteric asthma*, under the head of asthma in general, may perhaps be questioned. The Protean character of hysteria is well known. There is not an affection to which the human frame is liable, which hysteria may not simulate. Being aware of this circumstance, I have sometimes felt disposed to consider the disease now in question rather as a modification of hysteria assuming the appearance of asthma, than as an independent form of asthma occurring only in a hysterical person. The instances, no doubt, of hysteria affecting the air-passages, and inducing all the appearance of real disease in these parts, are by no means uncommon.

Aphonia, as well as simulated or mock *laryngitis* in hysterical females, often presents itself to the practical physician. I am inclined to rank under the same class of mimoses, what has been called *hysterical asthma.* In the example of this disease, mentioned by Floyer, I should be much disposed to set down the case as a mere ordinary one of hysteria putting on the mask of the asthmatic paroxysm. The affection called by Van Helmont "*asthma uteri*," appertains, no doubt, to the same form.

In an early part of this work we have seen that the occurrence of the asthmatic fit may depend purely and exclusively on a peculiar state of the nervous system generally, by which an abnormal degree of sensibility is imparted to the bronchial muscular fibres. For a similar reason, where there is great irritability of the system at large, as we know to be the case in hysteria, we need not feel surprised that the muscular apparatus of the bronchi should participate in this morbid sensibility of the nervous system, and thereby produce, by the habitual recurrence of this paroxysm, a real disproportion between the calibre of the trachea and the volume of the lungs. Considering the matter in this point of view, we may perhaps feel ourselves warranted in setting down an affection which really had its origin in the hysteric habit, as one deserving, in some degree at least, of being examined with respect to its treatment, if not its pathology, without immediate reference to the primary disease from which it took its rise. On inspecting the anterior part of the neck in hysterico-asthmatic patients, we find the same hardness and hypertrophy of the muscles there situated, as we do in those persons affected with common asthma uncomplicated with any hysterical affection. The same depression also above the sternum, indicative of contraction of the membranous part of the trachea posteriorly, is observed to exist.

The close connexion between hysteria, and the uterus (ὑστερα, womb), is fully recognised by all pathologists ; though in a great many instances this connexion is altogether inappreciable. Generally speaking, the disease makes its first appearance between the age of puberty and that of maturity, if we suppose the latter period to occur about the age of thirty-five; it attacks the frame at that precise time, when it is most susceptible of impressions made on it. Thus, whatever interferes with any degree of violence with the regular performance of either the nervous or circulatory functions, is capable of inducing the disease. Sudden and excessive evacuations, or the abrupt suppression of those which are normal and habitual, are equally liable to disturb the system, and so to bring on the hysterical asthma. The ordinary precursors of a paroxysm are lowness of spirits, without any assignable cause, involuntary tears, palpitations, flatulency, and a sense of nausea; but at times it will come on without any warning, and in some individuals the disease becomes habitual from frequent recurrence. Floyer, in his work on Asthma, gives a detailed account of certain inquiries proposed to a lady who was troubled with an hysterical asthma, and of her answers to them. According to her account she had a violent fever at the age of fourteen, and about one year afterwards she was attacked with fits of the mother (hysteria), and also with fits, wherein she was observed to rave, laugh, or keep silent. In one of these attacks tobacco was blown in her face, and recovered her; but on this being repeated, she found her "breath becoming streight;" this difficulty of breathing became more distressing to her than the fits of the mother. After marriage, at the age of twenty-two, the only remains of this affection consisted in mere shortness of breath; she thinks she inherited a disposition to the asthmatic or dyspnœic portion of the fit from her father, who was also troubled with shortness of breath. In these hysterico-asthmatic fits there was generally no expectoration, unless when the patient happened to labour under a cold. All the ordinary hysterical remedies were resorted to without any effect. "Anything of strong waters, or that is hot, or any stink," much offended her in the fits. The only medicine from which, she says, she derived any benefit was from Jesuit's bark, by the use of which she perfectly recovered. She found the air of London, as also that of Holland, agree best with her, whilst by going into a sharp air, as from London to Epsom, she immediately became attacked with difficult breathing, which went off on her returning to London. I cannot help saying, that the disease to which I here give the name of hysteric asthma, bears a great resemblance to that collection of symptoms to which Frank and others have given the name of *suffocatio hysterica.*

The following diagnosis between common asthma and the hysterical form of the disease is from the celebrated J. Frank.—See his *Internal Pathology.*

A. hystericum.	*Asthma* (ordinary).
1. The disease is accidental.	1. It is a constant affection.
2. It comes on at any moment during day or night.	2. It comes on, with very few exceptions, during the night.
3. The difficulty of breathing results more particularly from constriction of the larynx.	3. The difficulty of breathing depends on an affection of the lung.
4. There is violent agitation of the chest.	4. There is sometimes rather apnœa.

On the subject of distinction, F. Hoffman makes the following remark:—"Convulsive asthma differs entirely from hysterical suffocation, which depends only on spasmodic constriction, and on strangulation, as it were, of the summit of the fauces, larynx and pharynx, and which, by closing or diminishing the calibre of the larynx, cuts off a sufficiently free passage for the air to the lungs; whilst, in common asthma, the passage for the air through the trachea is free enough, and the defect is seated rather in the lungs themselves."

The following is an accurate description of the function of respiration modified during the hysteric paroxysm, as given by a-distinguished writer. During the fit the breathing is laborious and difficult; the inspiration is hoarse, or accompanied with a laryngeal râle, owing to the presence of mucus in the larynx. In other cases, the breathing is accompanied with sighs; sometimes it is panting and much accelerated, sometimes it is deep and slow: nothing, in a word, is so variable as the disturbance of this function. A little time after the fit, the respiration presents the same disturbance in different degrees; frequently it is hurried to an extraordinary extent. In no class of diseases, except in the neuroses, does the breathing attain so extreme a degree of frequency, without the life of the individual being seriously threatened. Some persons become affected with a distressing and dry cough; such a cough, in fact, as may impose on one for commencing phthisis. In very many cases, fits of suffocation come on at intervals more or less distant, with or without a nervous cough; at times there is aphonia, or loss of voice, of a very obstinate kind. Such a suffocative fit may also assume the appearance of an attack of croup, and, like it, come on at night. At other times, the suffocation and strangulation which happen are so alarming, as to incline one to suspect the presence of some affection totally different from hysteria. When we take these strange symptoms into consideration, we cannot feel much surprised at the names bestowed on this disease by the old physicians; viz., Suffocatio Hysterica, Suffocatio Uteri, &c.

I have, in another work of mine, referred to the fact, that hysterical patients do not often die consumptive. I have there stated what I conceived to be a satisfactory reason of this fact; viz., that in hysteria there is occasionally dilatation of the heart, which, by reason of the obstruction it occasions to the circulation, gives rise to intumescence of the mucous membrane of the air-passages. The consequence of this will be retarded expiration, the effect of which will be to enlarge the volume of the lung, and thereby to interfere with the progress of tubercle; in the same way the occurrence of asthma in hysteria will have a tendency to produce the same enlargement of the lungs, and the same curative influence in phthisis. The same may be said of other nervous affections, as epilepsy, hypochondriasis, &c. This masking, as it is called by Laennec and others, of phthisis by other diseases, is neither more nor less than an arrest of the tubercular disease by the supervention of another. Such masking is thus described by Laennec in the part of his work where he treats of latent phthisis:—"Nervous symptoms may sometimes mask phthisis for a considerable period; and I have known several patients in whom habitual dyspepsia, and other symptoms of hypochondriasis, have concealed pulmonary consumption for years. One of these patients, who for ten years had been considered hypochondriacal by several physicians, that he had worn out successively with complaints respecting his health, and who was, moreover, stout and strong, was one day seized with a pulmonary catarrh, accompanied by acute fever. Five days afterwards there appeared a puriform mucous expectoration, intermixed with a little blood; this, together with the cough, disappeared at the end of a few days; but half a year afterwards the symptoms of manifest phthisis established themselves gradually, and the patient died at the end of six weeks." What Laennec here calls masking, is in reality no such thing; it is, as I have said, the supervention of another affection on the phthisical disease. This supervention, however, of such a disease, it may be here observed, will not necessarily prevent, at some subsequent period, the liquefaction of tubercles previously existing; of the possibility of such an occurrence, I take particular care to apprise my patients or their friends, when I have succeeded in checking the progress of their phthisical disease by my peculiar method of treatment.

Treatment.—In considering the mode of cure of an affection which is but a mere complication of hysteria, it might probably be deemed the more philosophical plan to proceed to the treatment of the primary or fundamental disease itself. Recollecting, however, that, from our present rather limited acquaintance with the essence of diseases, and more especially those of the nervous kind, our method of treating them must be in a great measure a "medicine of symptoms," we must soon perceive that to the medicinal agents employed to correct that condition of the system with which hysteria is usually connected, it will be necessary to add others, the action of which may be more specially directed to relieve the spasmodic, or constricted condition of the superior portions of the air-tubes, on which the hysterico-asthmatic symptoms more immediately depend. And in carrying out this latter part of the treatment, I shall have occasion to recommend a therapeutic agent having a specific mode of action, which, though merely of a local nature, I have found to exercise a more decided and efficient influence in restoring the normal proportions between the several parts of the respiratory apparatus, than the single or combined powers of the various articles of the materia medica;—I allude to the process of inhaling. It has been already stated that hysteria may, when it occurs in the irregular form, simulate a variety of other affections, which differ *toto cœlo* from genuine hysterical disease, and the diagnosis of which will be found to require very considerable tact and experience in the medical practitioner. To detail the various modifications which this disease may assume, would be wholly irrelevant to my present purpose. My business is more immediately with that particular form of the disease, wherein it becomes complicated with asthma. I say *complicated* advisedly; because though I am aware that some pathologists feel themselves warranted in considering the hysterico-asthmatic state as a simple modification of hysteria, I am convinced that, for practical purposes, it will be more convenient to consider the affection a complication of hysteria and asthma. For even though I might be disposed to admit that this disease (hysteric asthma) may be at the onset but a simple hysteria assuming a new garb, and affecting by mere sympathy the summits of the air-passages, still every pathologist will acknowledge, that an affection, even though primarily sympathetic, becoming developed in any part or organ, may, by paroxysmal repetition, and frequently renewed irritation, eventually be converted into an actual, real disease of such part or organ, and require accordingly a specific or peculiar plan of treatment, such as would be indicated, were such organ the original and primary seat of the disease. It is for this reason that, in laying down the treatment of the disorder in question, I shall consider each of its elements in the first instance, pointing out the practice to be adopted for each respectively, always keeping in view, however, the nature and peculiarities of its associate.

In the first place, the attention of the practitioner must be directed to the uterine functions, with respect to the manner in which they are performed. Among the most prominent, if not the most important, of these should be considered that of menstruation. Should the menstrual discharge be in excess, the employment of astringents followed by tonic remedies may be recommended with advantage, and occasionally a few leeches over the pubic region. As in discussing the subject of the treatment to be employed in hysterical asthma, it is less the actual disease hysteria, than the hysterical diathesis we have to consider, I do not feel it necessary to enter minutely and in detail into the various remedies which have been extolled at different times as beneficial either in the hysterical paroxysm itself, or in the intervals between the paroxysms. I shall content myself with laying down the general treatment to be adopted in those cases where the hysterical disposition has distinctly manifested itself. The general rule ordinarily given for treating this disease is, to direct particular attention to the uterine system; that is, to see that the uterine functions are duly discharged. Without adverting to the vagueness and unsatisfactory nature of such a rule, I shall merely state my own method of treatment: I first look to the state of the alvine evacuations. Should these be deficient, or abnormally infrequent, I make it a point at once to correct such a state by purgatives, and the remedies of that class which I employ are those of the aloetic kind. Aloetics, from their action on the lower bowel, are known to affect the uterus in an especial manner on the principle, no doubt, of sympathy from contiguity. In the next place I attend to the state of the head; should this organ exhibit signs of congestion, I employ bleeding; in resorting to this operation I am determined by a variety of circumstances; first, by the action of the carotids, and next by the state of the head with respect to temperature; where the carotids pulsate strongly, and the head is hot, I order leeches to the temples, on the front of the neck, behind the ears, or on the nape of the neck; this will in general be found sufficient without having recourse to bleeding from the system; for the same purpose also the cold affusion, or the use of evaporating lotions may be adopted. So much for antiphlogistic treatment. We must in the next place endeavour to correct or remove any irregularity that may exist in the uterine functions, and to impart strength and firmness to the nervous system. For the accomplishment of this object a vast variety of medicines have been recommended. Among the principal of these may be reckoned those remedies which are supposed to possess tonic and anti-spasmodic powers. Thus, the preparations of iron have been much lauded for their tonic properties; the ferri ammonio-chloridum, as also the ferri potassio-tartras, are among the most important of these—their action will be promoted by the occasional use of the cold affusion, and by cold bathing where not contra-indicated. The cupri ammonio-sulphas is also deserving of trial. The fœtid gums hold the next place in the treatment of this disease; the compound galbanum pill is a favourite formula with me. From the employment of the ammoniated tincture of valerian also, I have frequently experienced good effects in my practice. These medicines are particularly useful where the patients evince a disposition to syncope:—where borborygmi are observed to take place, the use of musk and camphor may be employed, as well as a combination of sulphur and dried soda, as is mentioned in the case annexed. Stimulants will sometimes be indicated where there is a sense of sinking at the pit of the stomach. Trismus is not an infrequent accompaniment of this affection; it proceeds to such an extent at times as to occasion considerable difficulty in making the patient swallow either food or medicine; the best method of treating this is by turpentine, administered by the mouth if possible, and also by enema. The same remedy is found beneficial in the treatment of partial paralysis with which hysteric patients are sometimes attacked. Occupation of mind is a point which the practitioner should particularly insist on; as also exercise in the open air. As a symptom of that peculiar form of irritability which affects hysteric patients, may be noticed exquisite sensibility of the cutaneous surface. This is treated most effectually with the preparations of iron. As it is far easier to prevent the hysteric diathesis than to remove the disease when it is once established, parents should pay special attention to the mode in which their female children are brought up. Nothing contributes more to render them nervous and delicate in health than confining them for the greater part of the day in close and heated rooms, and obliging them to sit still for hours, training and exercising the mental powers to the almost total neglect of their physical strength and development. Such a mode of culture cannot but lay the foundation of the most disastrous consequences; and yet this anxious, overweening desire to store the mind with a great variety of knowledge, at a period of life when physical development should receive particular attention, is eventually disappointed, it being a well-ascertained fact that unless the functions of the body are maintained in their natural and healthy vigour, those of the intellect will suffer more or less; so strict, so intimate the connexion between the *mens sana* and *corpus sanum*. Before concluding this part of the subject I cannot avoid inculcating once more the indispensable necessity of strict attention to the bowels, and the occasional use of the shower bath. By close observance of these rules much may be done, and without it nothing. The society of females evincing much nervous mobility or actual hysteria should be sedulously and carefully avoided.

We are now come to consider the second element of the disease in question, viz., the asthma. After the detailed account already given in the preceding part of this work with respect to the treatment of the uncomplicated form of asthma, little remains to be said here. We may, however, again urge the necessity of applying a leech or two occasionally to the throat; of endeavouring, by the medium of mechanical agency, to make the expiration more perfect, and to effect a wholesome relation between inspiration and expiration. The state of the alvine evacuations must also receive attention, and, indeed, the function of digestion generally; for further and more minute details, I must refer to the rules already prescribed under the head of asthma.

CASE OF ASTHMA IN CONNECTION WITH HYSTERIA.

Miss Emily D., aged 25, had sustained, at the age of seventeen, a severe shock from witnessing an accident which befel a younger brother, who was run over by a carriage in one of our crowded thoroughfares. Being equally delicate both in physical and moral constitution, of retiring habits and a studious turn of mind, so dreadful a blow inflicted serious injury on her health. She was conveyed home in a state of insensibility; and for several days was subject to repeated swoonings, and at times to occasional delirium. In the course of a few months, after suffering from palpitation of the heart, with intermittent pains in this region, hysteria began to manifest itself. It may not be irrelevant to mention, that a young friend of hers, at that time a resident in the family, was subject to hysteric fits, and simulation therefore might, in some degree, have contributed to give rise to, or at least to develope the irritable temperament. The complaint gained ground, and after a series of hysterical attacks, Miss D. was seized with aphonia, or loss of voice, and remained for several weeks unable to articulate louder than in a whisper.

There was a singular coincidence observable in this patient, of most of the symptoms recognised at various times, and in various idiosyncrasies, as characteristic of the hysterical constitution. Singultus, or hiccough, to a distressing extent, and, on one occasion, continuing three days, with intermissions procured by brief intervals of sleep alone; borborygmi, or rumbling in the bowels, to such an extreme as to be heard at times (her friends assured me) in the room underneath her apartment, and accompanied with a splashing noise, as of water, which seemed to keep time with her respiration, descending and ascending in accordance with the inspiration and the expiration—these, and other symptoms of minor import, were all well-defined. After she had been suffering for a considerable period, with various alternations, however, and had been under the care of several medical men, I was applied to, chiefly from an apprehension on the part of her friends that the chest was beginning to be the seat of disease. Exploration of this region soon satisfied me that that there was no organic disease of any moment. I detected slight dilatation of the right ventricle, and the respiratory murmur was somewhat puerile; which states might be ascribed in part to the direct action of the violent hysteric fits she had undergone, and in part, to sympathy with the condition of the region beneath the diaphragm. The state of the respiration indicated too that the lungs were, in some degree, emphysematous; a natural result of the constriction of the larynx attendant on hysteria, which would have a tendency to enlarge the volume of these organs. The nervous excitability of the parts above the diaphragm might have proceeded from irritation of the abdominal cavity, particularly of the intestinal canal; which, as I have observed when examining the bodies of individuals known to have laboured under hysteric complaints, was, I make no doubt, the seat of dilatations, as well as contractions. She was particularly subject to uneasiness, and pain, (along with erratic fulnesses in the abdomen,) in the left hypochondrium, and especially just at the curve formed by the descending portion of the colon, where, from actual experience, I was satisfied that dilatation existed. She had long complained constantly of local distress here, and was fully persuaded, in her own mind, that some organic mischief was going on. This, indeed, appeared to have been the opinion of more than one of her medical advisers, since they had tried general bleeding: I was about to say to an unlimited extent certainly, for by the patient's own account, fifteen times in the space of one year.

The above sensations, I should state, were extended, at times, from the left hypochondrium to the pectoral region of the same side; manifesting themselves in sudden shoots, stitches, and catchings of the breath, so as to induce the suspicion of some pleuritic affection: but the impression on my own mind, as well by reason of the careful examination I made of her chest, as from my practice in hysteric complaints, convinced me that she laboured at the most under pleurodynia. Bearing down pains in the vagina, possibly from distension of the sigmoid flexure, rectum, &c., together with great accumulation of urine in the bladder, at times requiring the assistance of the catheter, formed likewise some of the more prominent symptoms. This last-named condition would continue for several days, so as to call for the repeated use of the catheter; whilst occasionally, the secretory powers of the kidneys would seem to undergo suspension, no urine being deposited in the bladder occasionally for two days. On pressure, there was exquisite tenderness, chiefly over the lower part of the abdomen; and although this symptom only came on, to my knowledge, some time after I was first consulted; yet, my patient assured me, that it had been manifested at rather an early period of her complaint, and that it had induced, in the physicians then called in, the belief of some inflammatory action, for which they had recommended general, as well as local bleedings, in addition to those already alluded to.

The remedies prescribed by me proved serviceable, and her health seeming rapidly to amend, I discontinued my visits. About six months after this, I was sent for in great haste. She had been seized with one of her former fits, and it was conjectured that she had sustained serious injury in falling—she had been found quite prostrate on the floor. When I saw her, she was lying apparently asleep, and both breathing and pulse were nearly natural. Having witnessed similar instances, and not being able to discover any signs of injury, I felt convinced that she was labouring under one of those singular fits, in which the state of the hysteric patient may almost be likened to that presented in somnambulism. The application of sinapisms along the course of the spine, strong frictions over the abdomen, and injections of turpentine, assafœtida, and castor oil, &c., were resorted to with transient benefit. I then resolved to try what the reception of the nitrous oxide into her chest (a practice already mentioned) might effect, by means of its exhilarating properties. It so happened, however, that a gentleman, who I was afterwards informed was considered by the family in the light of an accepted lover, came with her father into her apartment, and the sound of his voice (this is a circumstance of which I have known one other instance, and which men of enlarged professional experience will readily recognize) at once recalled her to consciousness.

For some period after this, she enjoyed a tolerable share of health, but undergoing some mental trouble, and having likewise caught cold from exposure to a shower of rain, she not only suffered from severe hoarseness, shortness of breath, and considerable laryngeal constriction, but from a sudden suppression of the catamenia, which had before been too abundant. Her cough was of an unusually irritating character, short, interrupted, and being a kind of bark, rather than cough. Her inspiration was sonorous and sibilant, and the feeling of uneasiness in the upper part of the larynx was so considerable, as to render me apprehensive that œdema of the glottis might ensue.

After recovering from this state under treatment, which it is unnecessary to detail, my patient began to be more and more affected with asthmatic breathing. She had before suffered, as it has been seen, from dyspnœa; but this was now exacerbated so as to amount to asthma in its spasmodic form, attended with the distressing borborygmi previously noticed. I tried numerous remedies with unsatisfactory results; but on exhibiting sulphur with dried soda, my patient experienced, ere long, a decided amelioration. Believing that her complaint might, in part, originate in the stomach and bowels, I employed the sulphur to accelerate the due peristaltic motion of the latter; and conjoined it with the soda, from the well-known power of alkalies in obtunding the morbid sensibility of mucous surfaces.

The administration of this medicine was attended with happy effects; but I attribute the recovery of the patient, which ultimately took place, to the constant change of air and scene, which the circumstances of her family enabled her to enjoy, rather than to any medicinal agents employed by me. To this happy result the conviction I succeeded in impressing on the mind, of the absence of organic disease, notwithstanding the distressing nature of the existing symptoms, I have no doubt, mainly contributed.

The above is one of the most decided cases of active neurosis I ever encountered; and the high exaltation of the functions of the visceral nerves was at times singularly marked. I have alluded to the suspicion entertained by the earlier medical advisers of the young lady, of the existence of inflammatory action in the hypochondriac region; and would beg the attention of the young practitioner to the fact, that the supposition of great pain indicating inflammation is a frequent source of error in practice. Antiphlogistic treatment is employed, and at first, I will allow, generally attended with benefit; but ultimately it aggravates every bad symptom.

Inflammation, it should be remembered, is not necessarily denoted by extreme pain; and the history of the complaint will, in general, form a sure test by which to distinguish its presence, or the contrary. Should it appear that the attacks usually come on suddenly, and disappear in a similar manner, we may be certain of the non-existence of inflammatory disease.

I must not omit to mention that I tried more than once the effects of moxas applied to the sides of the neck, the nerves of both animal and organic life being in this way at once acted upon: from the connection of the eighth pair particularly with the respiratory process, physiology obviously warrants the supposition of the benefits likely to be derived from the trial. But although in other instances I have witnessed satisfactory results, in the present I found the practice inefficient.

EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1.—Section of a small portion of the edge of the dried lung of an asthmatic individual, who lived many months after the operation of paracentesis, which I had performed three times on the left side of the chest. It was a case of hydrothorax, and the operations were ultimately followed by the removal of all symptoms of local as well as general dropsy. The specimen was taken from the right lung.

a Serous surface.
b Slight dilatation of the air-cells.
c Internal appearance of interlobular emphysema.
d Membranous canal of a bronchial tube, slightly dilated in its ultimate branches.
e Pointing to vesicular irregularity.
f A large interlobular cavity. The line terminates at the point of ligature.

Fig. 2.—Deeper-seated section of an emphysematous lung. The person from whom this specimen was taken had been long subject to catarrhal asthma. He underwent paracentesis thoracis by my direction, several years ago, at the "Infirmary for Asthma, &c.," which he had entered in a most distressing state, with

Fig. 1

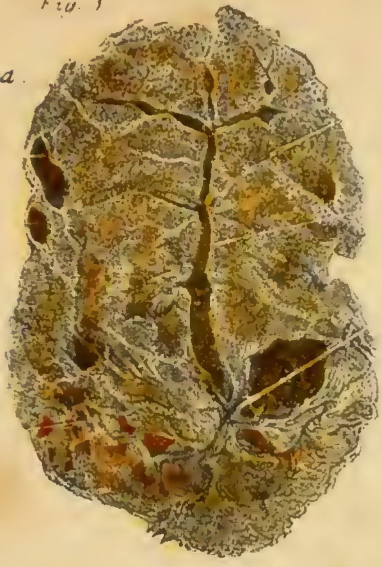


Fig. 2

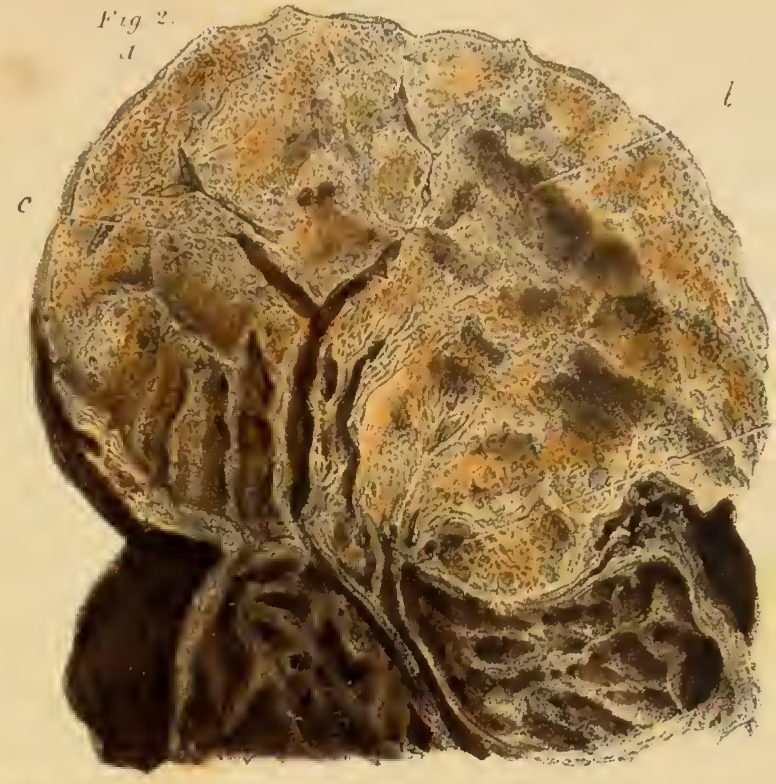
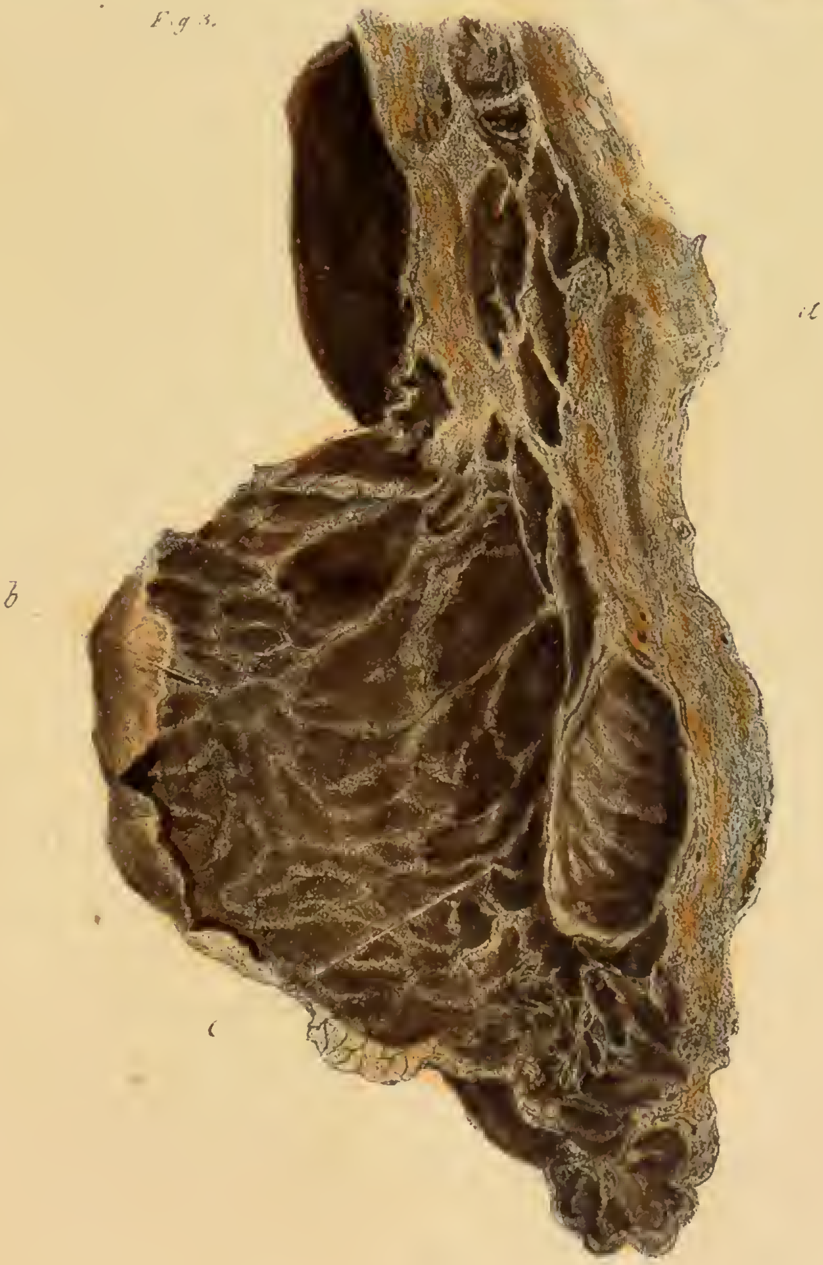


Fig. 3.



symptoms of general dropsy, and effusion into the left side of the chest. I recommended the operation with the view of affording him temporary relief: cure was out of the question. A quart of fluid was abstracted in one continuous stream; and, as the patient complained of faintness, the trochar was then withdrawn. I mention the particulars from the singular circumstance of the liquid, on its cooling, becoming a gelatinous mass: and I have since examined a body, at the request of the late Mr. Whitmore, surgeon, and found a similar mass exceeding eight pounds in weight, occupying the left pleural sac.

The operation afforded the patient great relief for two days succeeding it; but unhappily extensive erisypelas took place, surrounding the punctured part, under which he finally succumbed.

a Exterior surface of the lung.

b Air-cells in various states of dilatation, with the cellular partitions, separating the lobules, rather discernible.

c Bronchial tube, irregularly dilated, and plugged with concrete phlegm.

d Air vesicles here, and especially lower down, much enlarged; but this increase of size not near so perceptible as it otherwise would have been, in consequence of the application of a ligature previous to drying the lung.

FIG. 3.—A portion of lung taken from a female known to have been forty years asthmatic.

a Pulmonary tissue, become condensed by having been laid on a board to dry.

b Outline of a vast protuberance, exceeding an ordinary sized orange, originally of a circular form, and at its base lying over a corresponding depression in the lung, and transparent. There were no fewer than three of these globular enlargements on one lobe.

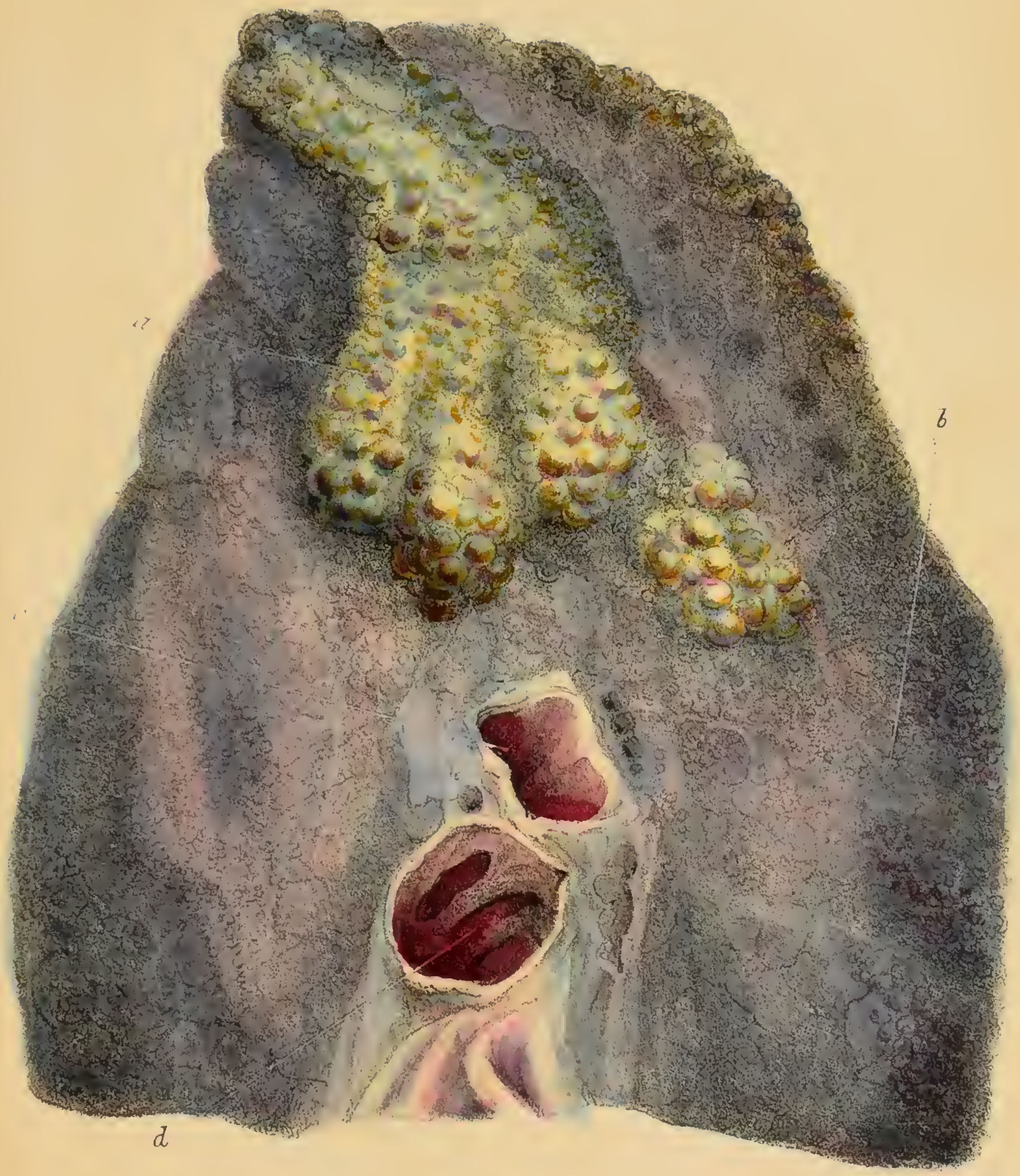
c Points to the residue of several intermediate septa, for the most part broken and elongated, with complete obliteration of the air-cells.

PLATE II.

On making a section of the anterior of the summit of the right lung, as here seen, there was found within it well-marked cicatrization, approaching at one extremity to the emphysematous vesicles therein displayed, of a cartilaginous texture, with bands of similar formation, but of irregular and lesser density, communicating with each other, and situate at various distances, embedded in the substance of the lung. There were, likewise, several old tubercles of a pasty and somewhat cretaceous nature, and extensively surrounded by black pulmonary secretion.

The individual (a female) from whom this specimen was obtained had been attacked, five years previously, by cancer of the womb, and the debility induced by this disease had brought on consumption. Fortunately for her, she caught a cold in the winter season, which gave rise to a bronchial affection, the asthmatic enlargement of the lungs consequent on which state effectually checked the progress of phthisis. The cancerous complaint above mentioned increased in severity, and was attended by fœtid discharges unusually profuse; and this circumstance, conjoined with domestic afflictions, operated sensibly on her general health. The bronchial disorder finally assumed a pituitous character; and the secretion increased to such an extent as, in conjunction with œdema of the lungs, to produce suffocation terminating in death.

PLATE II.



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left by previous consumption; which state had been arrested by the enlarged volume of the lungs produced by the encroachment on the trachea, and consequent asthmatic disorder above mentioned.

a Chronic inflammation of the pleura, with jelly-like substance beneath it.

b Indolent tubercles, seen underneath the pleura, and mixed with cretaceous matter.

c Large transparent vesicles formed by the rupture of several contiguous air-cells into one.

d Pulmonary tissue irregularly dilated.

e Partial extravasation of air on the surface of the lungs underneath the pleura.

I have detected this last-mentioned state in some asthmatic cases; and in consumption I have been sometimes disposed to think, that when this extravasated air becomes infiltrated into the substance of the lung, it may prove useful in promoting a cure.

PLATE IV.

FIG. 1.—A portion of the anterior edge of a lung in a state of vesicular emphysema.

a Vascular state of the interlobular partitions, as well as of the septa between the enlarged individual air-cells.

b Single vesicles of unusual dimensions, eminent and globular.

c Passes over irregular ovoid air-cells, and terminates in lobules much raised above the surface.

d Points to black pulmonary matter deposited on the parietes of the air-cells, as also on the interlobular septa. The line crosses over a multitude of small vesicles, of irregularly round figure, the largest equal to the third or fourth part of a millet-seed, separated by white partitions, and resembling the appearance of aërated saliva.

PLATE IV.

Fig 1

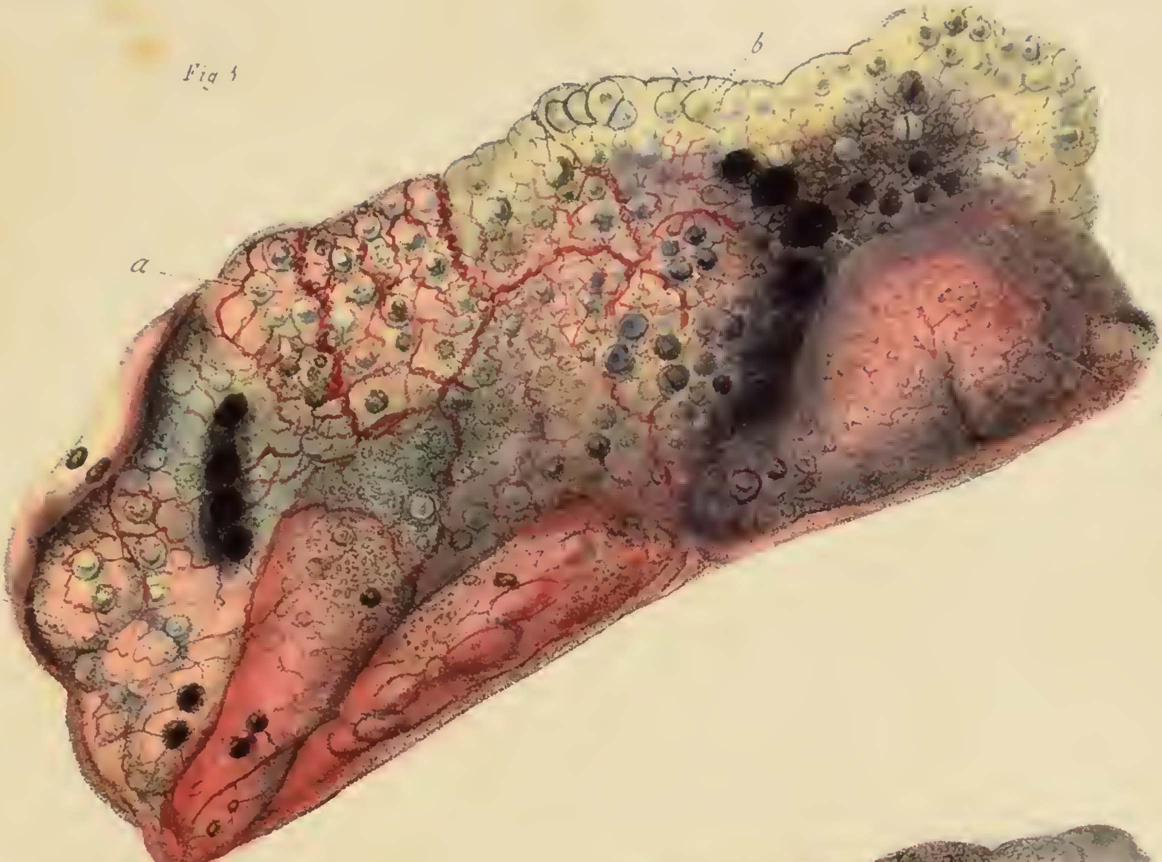

Fig 2

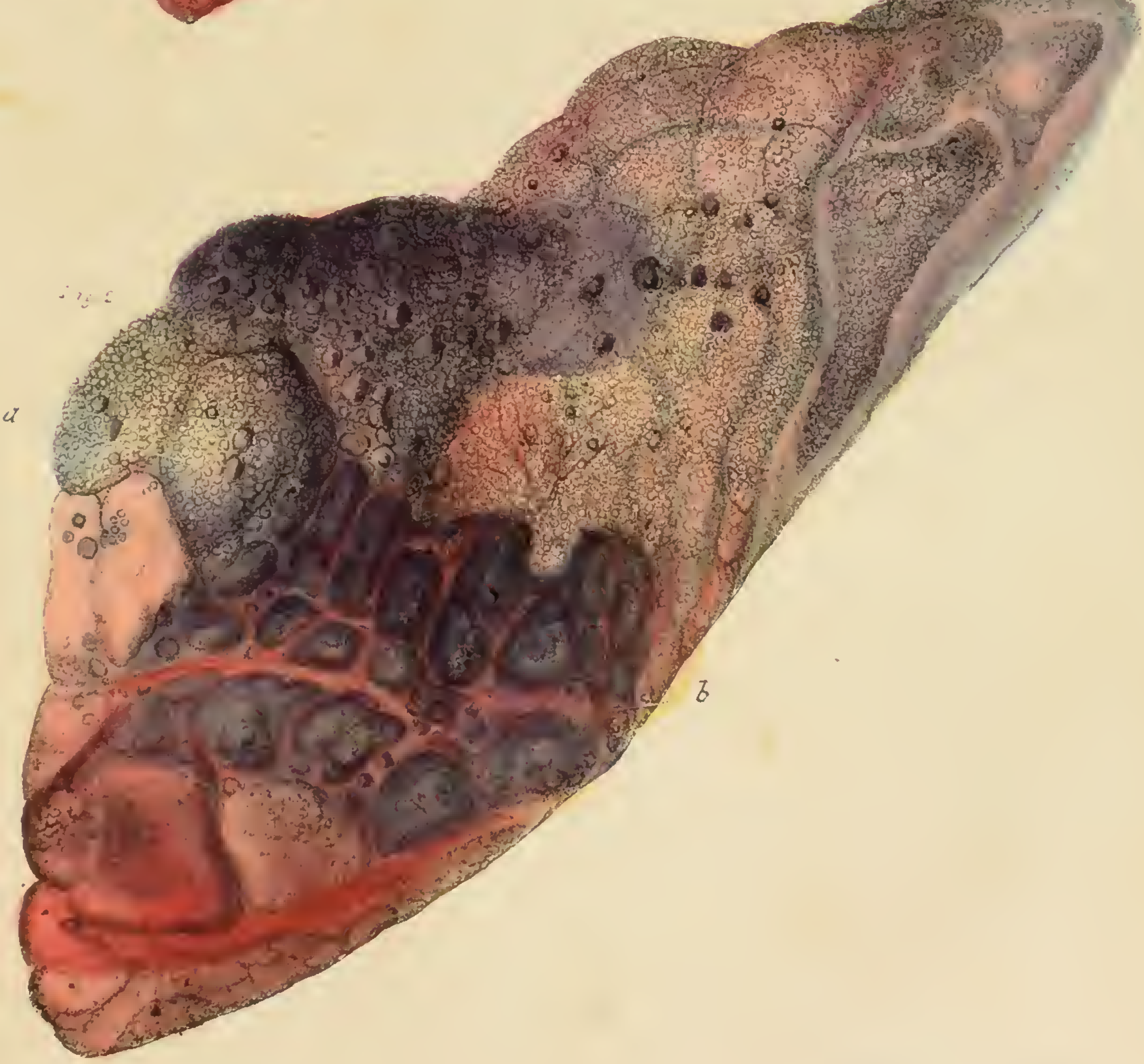

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PLATE V.

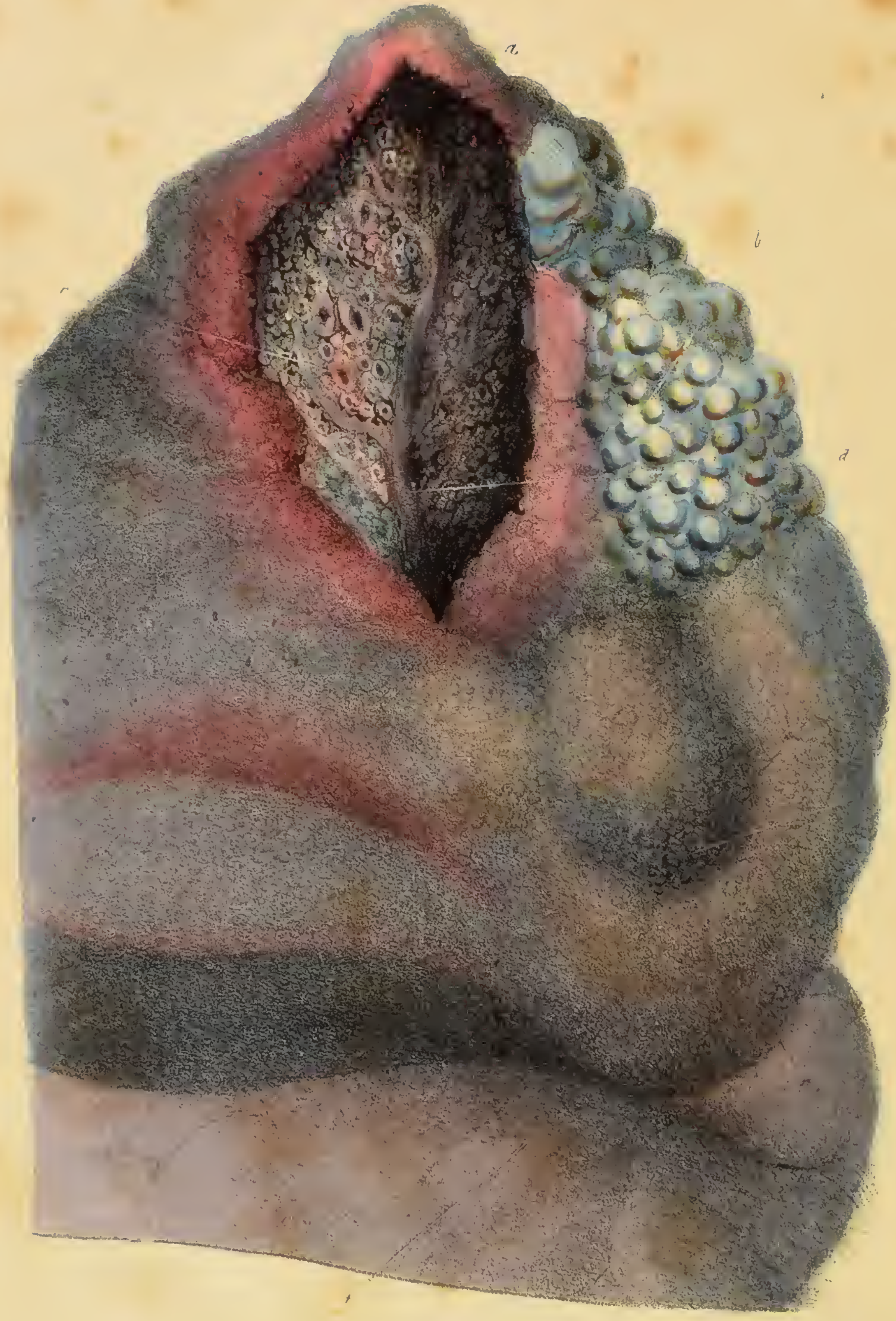

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FIG. 2.—The inferior surface of the lower lobe, taken from the left lung of an asthmatic individual.

a Points to a square partition, in which the pulmonary tissue is asthmatically dilated, as well as in a state of hypertrophy. Surrounding it are other lobules of all shapes and sizes, similarly affected.

b Section of the lung, exhibiting an unusually dense and vascular cellular membrane traversing its parenchyma.

PLATE V.

Upper portion of a lung taken from an individual who died with inflammation of the bowels. On referring to my case-book, I find that fourteen years before death he had been seized with asthmatic difficulty of breathing, which, from the history of the case given to me when consulted some time after the asthma had become habitual, I was persuaded must have supervened on and arrested consumption. This diagnosis was verified, when on his demise I obtained permission to examine the body. The lung of which the plate represents a part, and, indeed, the other lung likewise, completely filled the cavity of the chest before removal.

a Summit of the lung, with a patch of fibro-cartilaginous membrane.

b Transparent air vesicles of great size, and considerably inflated.

c Innumerable tuberculous granulations, of the size of millet-seeds, dark-coloured, and surrounded by black pulmonary secretion. The tubercles appeared never to have softened, and I make no doubt they were of many years' standing.

d Points to a blood-vessel.

e Air-cells enlarged, as they were, over the whole surface of the lungs.

In different parts near this, extravasations of air had taken place beneath the pleura.

f Points to another lobe of the lung.

The principles laid down in my work on Consumption are strikingly corroborated by the morbid appearances represented in the plate, in conjunction with the history of this case. So important is the knowledge of the fact to the asthmatic, no less than to the consumptive patient, that some of the forms of disordered respiration are the means by which nature frequently arrests the progress of phthisis, that I am induced to seize the present opportunity of still further demonstrating this singular pathological phenomenon. So easy, indeed, is it of proof to the morbid anatomist, that, although it seems surprising to me it should have escaped the activity of modern research previously to my recognition of the fact, yet, when once pointed out, I cannot help thinking that to overlook it argues a blindness as complete as that of the Homeric Cyclops. I was about to say that this mental darkness was unaccountable; but to him who knows by experience what professional prejudices aided by professional jealousy can effect, it is no mystery.

Without enlarging on this, the painful side of human nature, it may yet be profitable to look at some of the inconsistencies into which this perversity of the mind irrevocably leads those who deem equity towards another detraction from themselves. For instance, I have made a discovery in the pathology of diseases of the chest, which the greatest authority on such subjects, the talented Laennec, expressly asserted would be made: and I find a clique of persons, who profess the highest respect for this eminent pathologist, and readily acknowledge the immense services rendered by him to practical medicine, consider that portion of his work which contains this statement as absolutely chimerical.

The object to which the immortal Laennec chiefly devoted his labours, in pursuit of which he sacrificed his life, to the demonstration of which he went on from discovery to discovery, and accumulated fact upon fact, and to establish which his whole system is built up—this some of his followers and admirers explicitly contradict.

A few quotations from Laennec's work will suffice to convince every rational person with what facility persons, whose minds are warped by prejudice and blinded by self-conceit, may draw from a writer's statements conclusions diametrically opposed to the very letter and spirit of all he may have written on any given subject.

In the third section of the general head "Phthisis Pulmonalis," Laennec expressly states, when speaking of the curability of the disease, and the cases of cure adduced by him, "My experience leads me to esteem such cases very common: those above related occurred to me in the course of some months, and I have since met with others." Again, in summing up, he says: "Finally, recovery in cases of pulmonary phthisis, where the organ has not been wholly invaded, seems to me to present no character of impossibility, either as regards the nature of the disease or that of the organ affected." This is plain, and to the point. How have these, and other similar passages, been overlooked by those who so strenuously deny the curability of consumption?

I am aware that Laennec considered the cure of consumption in its early stage beyond the reach of art, but believed, to employ his own words, "that, in some cases, a patient may recover after having had in his lungs tubercles which have softened, and formed an ulcerous cavity." However, this establishes nothing against my argument. He still declares his belief in the curability of consumption in its latter stages. I, for my own part, have proved the possibility of cure in both the early and latter stages: the latest are, of course, beyond man's power.

On a careful review of the cases of cure brought forward by Laennec in his third section, and a comparison of their details with the principles first developed by me in my Treatise on Consumption, it will be found that the appearances described by this distinguished man are but so many proofs of the doctrines insisted upon by me. It is with no idle view of wishing to detract from him, that I affirm he saw no further than the morbid appearances, and did not understand the way by which they were made to contribute to the recovery of phthisical patients; he did not, in fact, penetrate into their *modus operandi.* He had done enough for glory, and more for the advantage of his fellow-creatures, than two-thirds of the profession living or dead. Yet was he on the very verge of the discovery I have promulgated. Nay, I am almost convinced, from numerous passages in his work, that want of moral courage alone restrained him from anticipating me. After stating that he had several patients under his care suffering from chronic catarrh in whom pectoriloquy was clearly discernible, whilst he had met others who presented the same phenomenon, together with a slight habitual cough, almost without expectoration or any remarkable alteration of the health, he mentions that "a lady, who is in this state, was formerly under Bayle's care. He left with her, according to custom, notes containing the history of her case during the time he attended her; and these describe a disease precisely similar to pulmonary phthisis, which commenced fourteen years back. Contrary to every hope, the patient got well: she is stout, and the inconveniences she suffers from time to time, a slight, infrequent, and scarcely sensible cough excepted, are purely of a nervous character. Pectoriloquy is distinctly heard in the summit of her right lung. I entertain no doubt that in patients of this kind ulcers exist, transformed into fistulæ." Immediately after this he adds: "Indeed I feel convinced, that, in proportion as the use of the stethoscope shall become general, and that great numbers of phthisical patients shall be examined with it, it will be found, that, those in whom undoubted pulmonary phthisis, characterized by pectoriloquy, changes into chronic catarrh, often continue to exhibit pectoriloquy all their life; and that on opening the bodies of these persons anfractuous cavities will frequently be discovered lined with a semi-cartilaginous membrane."

In justice to myself, I may perhaps be allowed to cite the following passage from the work of mine above alluded to: "It is, indeed, strange that medical men have not noticed the non-liability of the asthmatic individual to pulmonary consumption; and that various species of catarrh are the instruments by which nature chiefly arrests that disease." Let this be compared with the words of Laennec (I still quote from the same third section): "I have occasionally found in subjects that had been affected with chronic catarrh, and died of various other diseases, anfractuous cavities lined by a semi-cartilaginous membrane, precisely similar to that which lines old ulcers of the lung, to which these cavities bore an exact resemblance, with the exception that they did not contain tuberculous matter. Such of these patients as had been carefully interrogated referred the origin of their chronic catarrh to a severe disease under which they had laboured at some former period, and which had presented the symptoms of pulmonary phthisis, often indeed to such an extent as to cause them to be considered at the time as inveterately consumptive."

Now, what can be inferred from the above, but that Laennec had noticed the fact of catarrh's supervening to consumption, and the cessation of the latter disease on this supervention, but had never been induced to trace the connexion between the primary disease and that which supervened, nor to investigate the relation in which they stood towards each other?

The subject is of such paramount importance, from the ravages annually committed by this disease, that I shall not think it time lost, if, by pursuing these quotations from Laennec a little further, and thus shewing that his opinions are substantially the same as my own, I shall induce but one medical man to believe there is scarcely an ill so great for which Heaven hath not provided the means of cure.

In this same section Laennec adduces a number of interesting cases, and, from a close investigation of the morbid appearances found on dissection, he feels satisfied "that pulmonary tubercles are not in every case a necessary and inevitable cause of death; and that, after their softening has formed an ulcerous cavity in the interior of the lung, a cure may take place in two ways—either by the conversion of the ulcer into a fistula, lined (like all those which may exist without endangering the general health) by a membrane precisely similar to the tissues of the healthy animal economy, or by a more or less perfect cicatrix of a cellular, fibro-cartilaginous, or semi-cartilaginous nature." Continuing his remarks on the same case, he says: "If the particulars could have been obtained of the previous condition of the subjects of these cases, we should undoubtedly have learnt that all had experienced, at some period, either a cough of long duration, or severe catarrh, or even a disease which had long been taken for pulmonary phthisis, and had terminated in an unexpected cure."

In his remarks on case 26, after enumerating the various concomitants of pulmonary phthisis, which are of such a nature as to render the cases in which they occur in a manner desperate, he says, "But, admitting the worst conclusions which may be drawn from those extreme and (considering the great number of consumptive patients) rare cases, it will not be the less certain, that, in many instances of pulmonary phthisis, we may still (judging from the cases we have related) entertain the hope of a real cure, or at least of such a suspension of the symptoms as is almost equivalent to it, since the patient may be restored to a state of health perfect enough for all the purposes of social life, and this for a course of years, before the developement of the tubercles, which have remained in the state of crudity, brings on a new and final attack of phthisis."

Let the following passages from my work on Consumption be compared with the above quotations, and it will be perceived that they coincide as to the facts, the only difference being, that I have endeavoured to explain those facts. "Neither perfect recovery, nor indeed exemption from the danger of relapse into a consumptive state, is found to occur, except in very rare instances, unless the pulmonary organs become naturally or artificially voluminous; which not unfrequently happens by the supervention of some catarrhal state of the larynx, trachea, or bronchial tubes. It is a most fortunate circumstance for some affection of this kind to take place early, as it rarely fails to arrest this most fatal disorder. When the lower lobes of the lungs are entirely free from tuberculous matter, (which is often indisputably the case for a considerable period, unless there be strong hereditary predisposition,) and though there exist, at the same time, cavities in the superior part of one or both lungs, clearly indicated by perfect pectoriloquy, there is generally a never-failing hope of recovery to be entertained, provided an emphysematous sound can be heard. In fact, I scarcely ever knew a consumptive person who did not lose all his formidable symptoms, and regain health, when an emphysematous, or a semi-asthmatic, change had early taken place; and, likewise, I never saw an individual become consumptive who had been a subject of chronic catarrh of some years' standing, or of any species of asthma." Again: "The greater number of what are commonly regarded as cases of catarrhal asthma originate in pulmonary consumption, the progress of which has been arrested by the supervention of that affection, but in which neither fresh crops of tubercles nor hectic fever need be apprehended."

For the purpose of elucidating what has been above stated with respect to the volume of the lungs being increased either by nature or by art, and the influence of such increase in arresting the progress of phthisis, it may be as well to observe that the mode in which inhalation operates is by inducing a change in the tissue of the lung analogous to that produced by nature through the medium of catarrh, and is thus briefly explained in the same work. "There are few cases of incipient consumption, but what will be rapidly improved by this mechanical treatment steadily pursued. The disease being thus checked, the same changes will follow which are attendant on catarrh. The nodules of unripe tubercles will become innoxious in consequence of being surrounded by black secretion, or what has been called black pulmonary matter; and such small cavities as may be already formed will have their surfaces soon brought into contact, so as to heal by what surgeons term the first intention. It is, we must own, preferable to effect pulmonary expansion by sure artificial means, rather than to depend upon the uncertain production of catarrh. And there is another point gained, inasmuch as recovery takes place unaccompanied by the distressing cough or difficulty of breathing generally attendant on those cures, which nature herself now and then accomplishes by introducing this less fatal, yet distressing complaint."

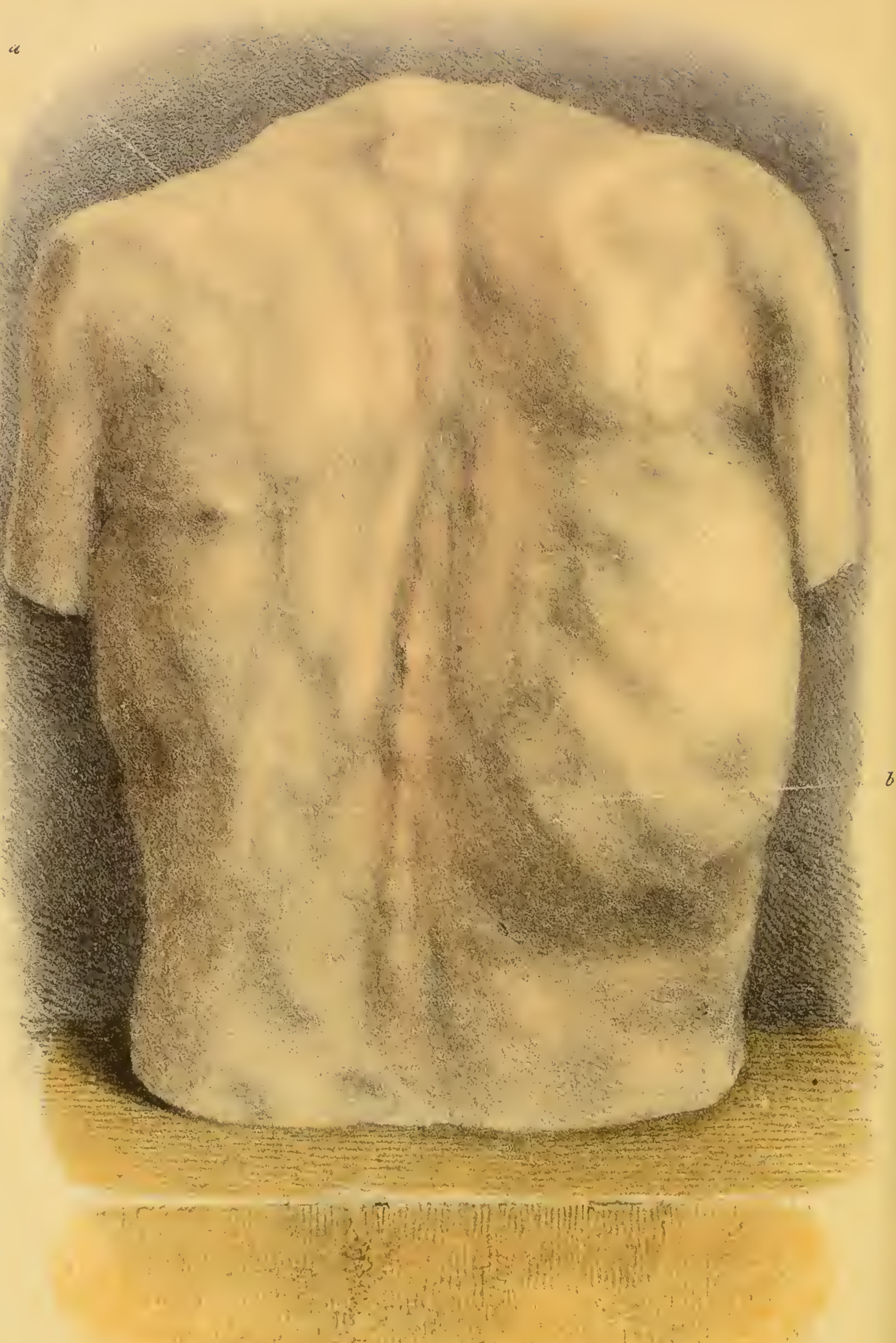
A case is recorded by M. Cruveilhier, in the 5th livraison of his "Anatomie Pathologique," which bears such strong evidence of the correctness of my views, that I am tempted to notice it. The professor states that a labourer, aged forty, entered the Maison Royale de Santé with all the symptoms of laryngeal phthisis. He had been seized with hoarseness about ten months previously to his admission. On examination, his lungs appeared healthy, with the exception of a dry and sonorous cavity in the summit of the right lung.

The patient died suffocated by the laryngeal affection. On opening the body, "the vast cavity in the summit of the right lung was perfectly cicatrized."

Here is the healing up of a cavity performed by nature. The affection of the throat impeded the expiration; in consequence the air became imprisoned in the air-cells; by these means the volume of the lungs was developed, and by such development the surfaces of the cavity were brought into apposition, and a cure effected.

It is this process of nature which I imitate by mechanical means, avoiding the danger of any other complaint, as in the above case, being engrafted upon the primary one; for that the cavity was antecedent to the laryngeal affection, admits of no dispute. I propose, by anticipating, yet imitating nature, to

PLATE VI.



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effect the good she first pointed out, and avoid the irregularities into which her unassisted efforts are often betrayed. What I propose, indeed, I have accomplished. Inhalation, on the principles first explained by me, and modified in accordance with those principles, is simply operating without, what nature too often performs with, danger. The principle is simple, for nature is ever so; but it is powerful. It effects what our great master in pulmonary disease has left us his testimony would take place. Consumption may be cured, says Laennec; it can be cured, exclaims Nature. Morbid anatomy, as we have seen, attests the fact.

PLATE VI.

Posterior view of a bust moulded from the chest of an individual who had suffered contraction of one side of the thorax, in consequence of pleurisy. The other side had subsequently become highly emphysematous. It will be seen how considerably the chest is enlarged by the increased volume of the lung, resulting from the emphysema; and experience has proved to me that enlargement of even a portion of the lungs on one side only will prolong life, although the other side should be at the same time the seat of tubercles. The plate shews the rounded form imparted to the right side of the chest by the emphysematous condition of the lung in asthma of long standing: when the entire lungs become voluminous, the whole of the thorax, of course, is rendered proportionally prominent and rounded.

a Depression of the shoulder, underneath which are seen the diminution of the muscles, and the drawing together of the ribs usually consequent to certain pleurisies. I would here beg attention to an error into which Laennec seems to have fallen, when he considers contraction of the affected side the invariable result of such cases. When the affection has occurred at an early period of life, I have known instances in which the patient has become what is termed pigeon-breasted, without any difference of size being observable between the two sides. To return to the plate, it will be perceived that the length of the chest is much diminished on this, the diseased side, and the spine inclines towards it.

b Effects of the emphysematous enlargement already noticed, with expansion of the intercostal spaces.

PLATE VII.

Drawings of different forms of inhaling apparatus recommended by me, with the view of establishing the normal relation between inspiration and expiration.

Fig. 1.—A section of the simplest form of the tube furnished with a valve.

a Commencement of the mouth-piece, and oral orifice of the canal of the tube.

b Points to the head of the valve, resting against a bar which limits its further ascent.

The two arrows indicate the directions of the inhaled and exhaled air.

Fig. 2.—A somewhat more complicated form of the tube, though acting precisely on the same principle as the preceding.

a Orifice of mouth-piece.

The arrows indicate the directions of the inspired and expired air.

Fig. 3.—Represents a leaden tube, furnished with a mouth-piece (*a*).

PLATE VII.

Fig 1.

Fig. 2

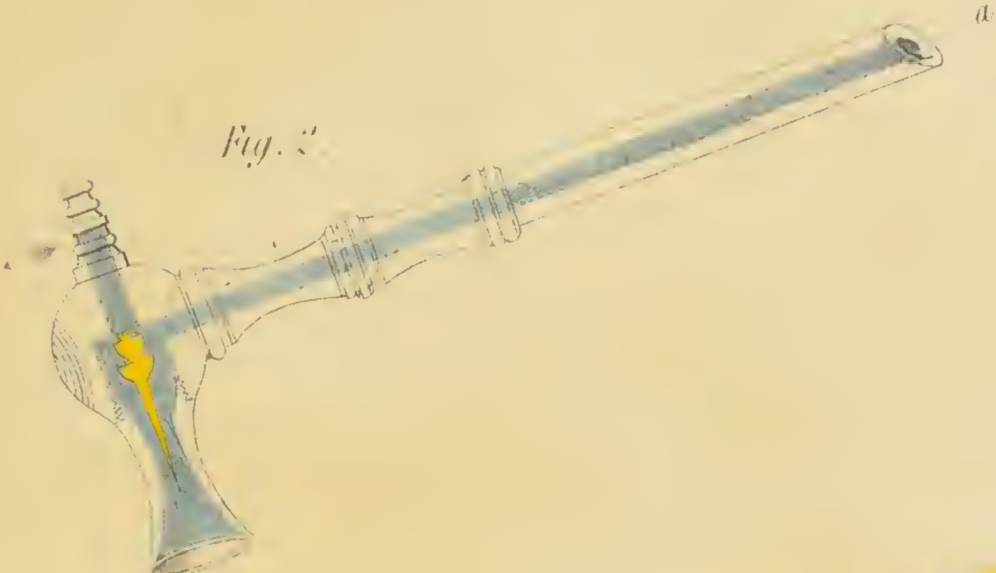


Fig. 3

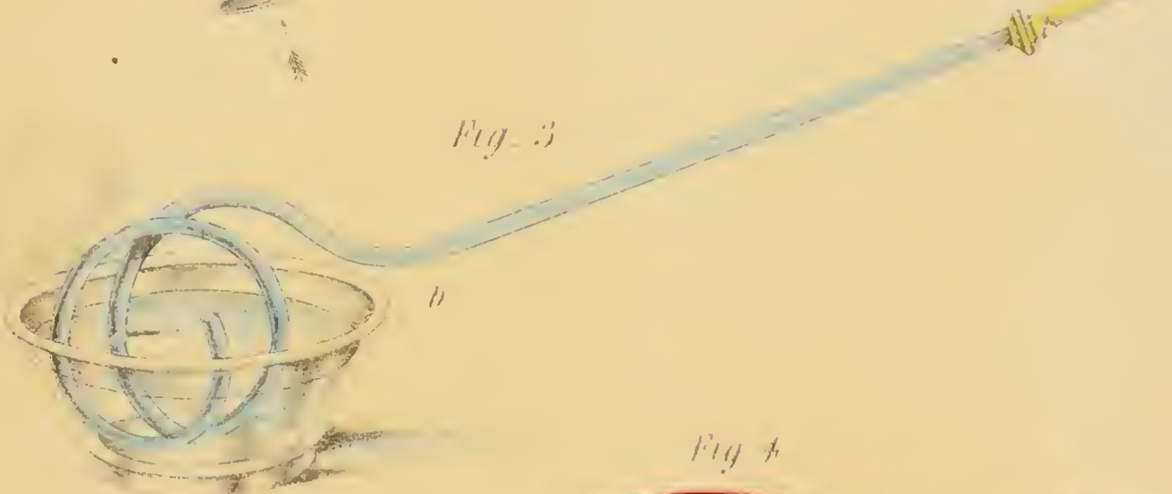


Fig 4

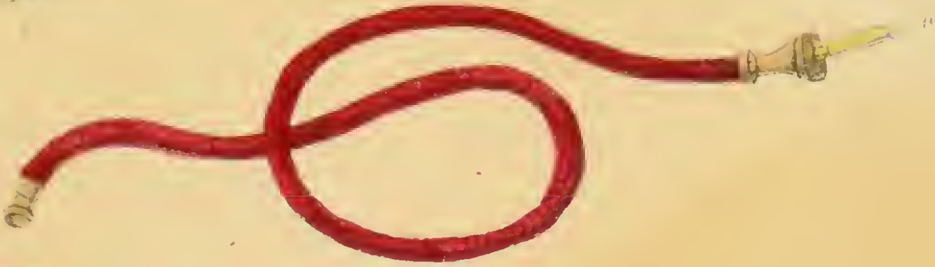
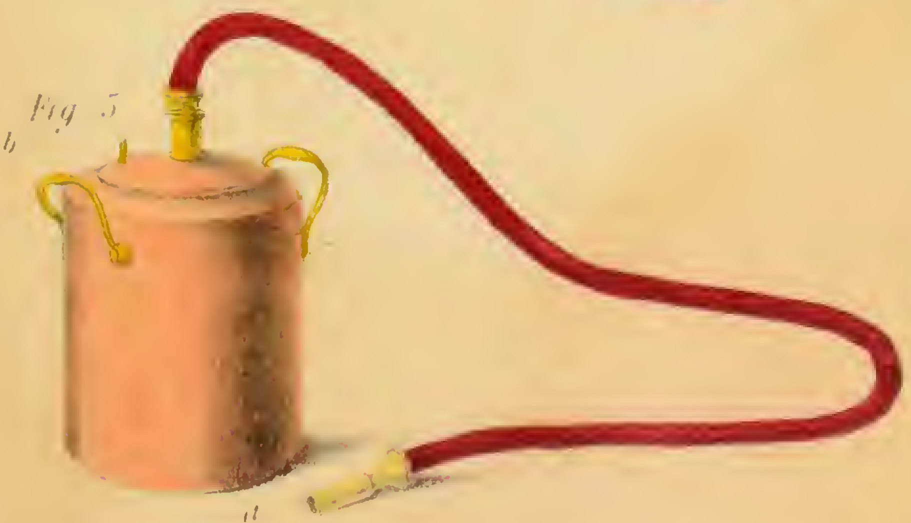


Fig 5



b The orifice of the expiratory termination. The object of the apparatus is, that the patient may inhale warm air; which is effected by placing the coiled extremity in a vessel containing hot water.

FIG. 4.—A flexible tube.

a Mouth-piece.
b Expiratory orifice.

FIG. 5.—Apparatus for inhaling, to be two-thirds filled with warm water.

a Mouth-piece and commencement of the tube.
b Air-vent and expiratory opening inserted into the cover of the vessel

Some individuals, very few in number, being unable to submit to the momentary suspension of any communication with the external air, are obliged to have recourse to the expedient of using a tube having no valve. Much of the virtues of these tubes depend on the duly adjusted size of the expiratory orifice.

In order to explain how the employment of the process of inhaling can be available in asthma, a few remarks may be deemed necessary. In the first place, pathological anatomy demonstrates to us that in asthma the volume of the lungs is abnormally large: in this disease, also, the expiratory powers are obviously impaired; they have become decidedly enfeebled. Now, the effect of employing the tube, which has the power of retarding and partially impeding the expiration, will be to impart energy and activity to this function, whose powers we have already seen to be impaired in asthma, precisely on the same principle that calling any muscular apparatus into vigorous exertion will augment the force of these muscles. By thus exalting the expiratory powers, we remove the effects occasioned by their previous relative inactivity. These effects chiefly consisted in increased development of the lung. Another result is, that by this process the size of the trachea will be increased, its calibre being constantly dilated from below upwards, and further facility in this way imparted to the expiratory function. Thus we see (what at first sight may appear strange, and in some measure contradictory) that the employment of precisely the same means will produce the two diametrically opposite results, viz. that of augmenting the volume of the lungs when these organs have become either positively or relatively too small, and that of diminishing, or at least arresting, the further progress of development in these organs when they have become too large. The beneficial influence of diminishing the volume of the lungs in diseases of the heart, thereby affording to the latter organ sufficient room for the discharge of its important functions, must be too obvious: hence the value of inhaling, in some diseases of the central organ, more especially when such are attended, as is generally the case, with increased volume of this viscus.

Before coming to a conclusion, I would advert to a circumstance, which, from its great importance in a practical point of view, is well deserving the attention of both patients and medical practitioners; viz. the inutility, nay, palpable absurdity, of expecting for a moment that an emphysematous lung—a lung much enlarged beyond its healthy dimensions—can be again brought down to its normal size and condition by any such agency as mere removal to a foreign clime. The possibility, however, of effecting so desirable a result by the simple means recommended by me, has long been, and still daily continues to be demonstrated, by the restoration to perfect health and comfort, and total exemption from all dyspnœic symptoms, of numerous patients, several of whom had been asthmatic from early years, and had continued to be so even to the adult period of life. In further corroboration of the truth of this assertion, I could adduce the testimony of several respectable medical men, who have themselves been eye-witnesses to many of these cases, and who readily expressed their full conviction, that such a change of the pulmonary tissue could never be accomplished by the employment of any preparation whatsoever of the articles of the Materia Medica. Let me not be misunderstood: I mean not to exclude the employment of medicine; so far from that, I consider it a valuable, nay, indispensable adjuvant, but no more.

DIRECTIONS FOR THE USE OF THE INHALING TUBE.

Let the patient inhale and exhale, through the tube, for at least eight or ten times in the minute, with the lips closely applied to the mouth-piece. Little effort is required beyond that of ordinary respiration. As an easy posture, and freedom from any tightness of dress, are indispensable, the opportunity may occasionally be taken of inhaling in bed.

On commencing a course of mechanical respiration, it is recommended that the patient use the tube before meals, for about five minutes, three times a day, viz., morning, noon, and night, and gradually increase the period by a minute or two each day, until it reach half an hour. The process must then be reversed, and the duration of the respiratory exercise be reduced in the same gradation to the five minutes with which it commenced.

In this manner the employment of the tube should be continued long after the removal of the symptoms of the disease.

If any fatigue be felt, the tube may be laid aside for a short time, and then resumed.

The patient should avoid inhaling when there is spitting of blood, difficult breathing, pain in the chest, or during the presence of any inflammatory symptom.

THE END.

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